Croplife®

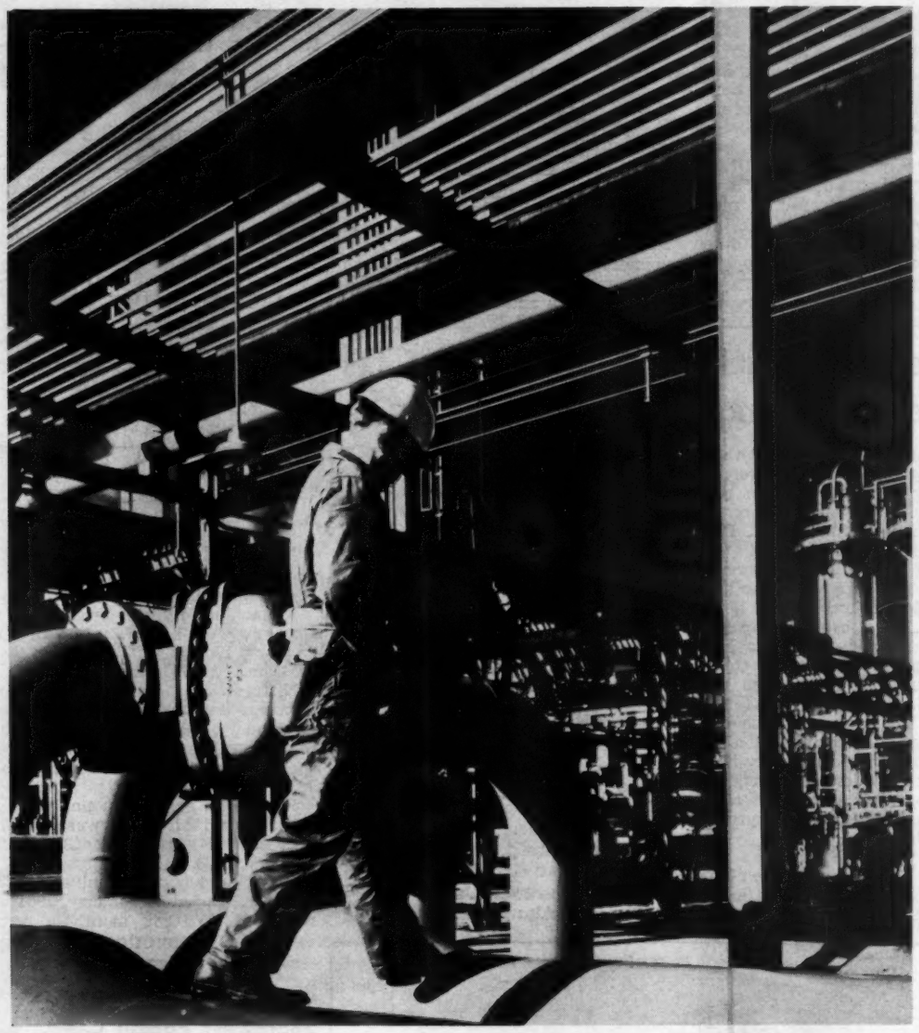
A BUSINESSPAPER FOR THE FARM CHEMICAL INDUSTRY

MEMBER, BUSINESS PUBLICATIONS AUDIT

BPA

A Miller Publication
Business Journalists Since 1873

Vol. 8 APRIL, 1961 No. 4



NEW NITROGEN FACILITIES—The nitrogen products division of W. R. Grace & Co. has announced that its new ammonia facility at Memphis, Tenn. is now on stream. The new facilities will add 60,000 tons a year to the Grace plant's output, according to William J. Haude, president of the division. Total capacity of the Memphis plant is now more than 160,000 tons a year. Story on page 46.

News Briefs . . .

Complete Stories Inside

Features Inside

Accepted as a Controlled Circulation Publication at Minneapolis, Minn. P. O. Box 67, Minneapolis 40, Minn.

Subscription Rates: $5 for 1 year; $8 for 2 Years Single copies 50¢

Preliminary USDA Report . . .

Fertilizer Tonnage Drops Slightly During 1959-60 Year, But Nutrient Content Up 2%

FERTILIZER CONSUMPTION in the U.S. during the year ended June 30, 1960, was generally lower than that of the preceding year, according to the preliminary report on farm and non-farm use of commercial plant foods just issued by the U.S. Department of Agriculture. The report, compiled by Walter Scholl, Marion M. Davis, and Caroline A. Walker, Fertilizer Investigations Research Branch, Agricultural Research Service, says that consumption came to 25,022,000 tons, which was 290,000 tons (1.1%) less than the 25,312,672 tons recorded for the year ended June 30, 1959.

The report is based on shipments by manufacturers, sales by liquid nitrogen applicators and on state tonnage reports, the authors say.

Increases in fertilizer use occurred in 18 states and the District of Columbia (Table 1). In these states, 713,000 tons more fertilizer were consumed totaling 9,605,000 tons or about 38% of overall consumption. California, Florida, and Georgia accounted for 526,000 tons of the increase. Consumption decreased in 31 states and Puerto Rico by 1,003,000 tons, approximately one-half of which was in Illinois, Missouri, North and South Carolina. These changes in consumption from the preceding year were scattered through most of

Turn to **CONSUMPTION** page 8

Tight Potash Supply Seen in U.S. Report

WASHINGTON—A possible tight supply of potash, increasing competition in the nitrogen trade, and prospects for an increase in U.S. exports of fertilizers in 1961 are seen in a recent industry report by the U.S. Department of Commerce.

In commenting on the world potash situation, the report says that supplies, which became tight during the final half of 1960, may actually lag behind demand in 1961. Factors contributing to this situation, the report says, are a slowdown strike in French mines and a mechanical breakdown in Spain. The former situation has now been settled, but not before reducing potash supplies.

"Consequently," the report continues, "the U.S. potash industry may be faced in 1961 with a combined domestic and foreign demand for potash that exceeds supplies."

The report notes that difficulties encountered by potential producers sinking mine shafts in Canada have somewhat delayed the availability of potash from that source. It has been announced, however, that the shaft seepage situation has been overcome and that production in Saskatchewan is expected to be under way by late 1961 or early 1962.

The nitrogen supply-demand situation is somewhat different, according to the report. The immediate outlook for world supplies points to increased capacity and sharper competition. "World production and consumption of fertilizer nitrogen during the 1958-59 fertilizer year are estimated by the Food and Agriculture Organization of the United Nations at 8,750,000 and 8,000,000 metric tons N, respectively. Although nitrogen sales in the Common Market area were up in 1959-60 European sources indicate that there was considerable price cutting and loss in earnings by producers. Relief from the surplus does not appear imminent inasmuch as capacity is projected through 1965 at an annual rate of increase of 880,000 tons N, and consumption growth at 800,000 tons.

"In the United States, total 1960 production of nitrogen (synthetic and byproducts for fertilizer and industry) of approximately 4,200,000 tons N is estimated to have exceeded 90% of capacity. An industry operating so close to capacity would presumably be looking toward expansion. This expectation is confirmed by the announcement in recent months of 7 new synthetic ammonia plants. These new projects will total approximately 500,000 tons N, bringing overall nitrogen capacity to 5,000,000 tons or more by the end of 1962."

The favorable prospect for increasing U.S. exports of fertilizer in 1961 is based on the adverse international balance of payments. Because of this situation, the International Cooperation Administration (ICA) has been directed to restrict purchases of commodities abroad with its funds, a development that may result in more fertilizers being procured in the U.S. for aid programs in Korea and other countries. Formerly, foreign suppliers have underbid the U.S. industry for much of the ICA fertilizer business.

Pacific Guano to Operate On Independent Basis

LOS ANGELES, CAL. — Pacific Guano Co., formerly controlled by a Hawaiian firm, will be operated as an independent agricultural chemical marketing organization, according to the company's new owner, Collier Carbon and Chemical Corp.

Pacific Guano Co. markets a complete line of fertilizers, insecticides, and herbicides under the familiar "Gaviota" and "Gavicide" brand names throughout California, Arizona, and Nevada.

William H. Foster, long associated with the chemical fertilizer industry, has been named president. H. G. Conley, J. G. Hollingshead, P. V. Weingart, and F. W. Doyle continue as officers.

Pacific Guano also owns a 60% interest in Western States Chemical Corp., manufacturer of ammonium phosphate fertilizers marketed under the "Gro" brand.

TWO APPOINTMENTS

CHICAGO—Industrial Filter & Pump Mfg. Co., Cicero, Ill., has announced the appointment of two sales engineers. The appointees are Richard Crain and John Barone.

Spencer Confirms Reports of Merger Talks Between Itself and Southern Oxygen Co.

KANSAS CITY, MO.—Spencer Chemical Co. has confirmed reports that merger negotiations have been conducted with the Southern Oxygen Co., Bladensburg, Md. John C. Denton, Spencer president, said that negotiations between the management of the two companies have been under way for several months in order to provide a basis for merger agreement. These negotiations have been promising, with Spencer to become the surviving corporation, Mr. Denton said.

However, no merger will be consummated without the approval of the boards of directors and security holders of both companies and no requests for such approvals have been made by the managements of the respective companies, he added.

Spencer Chemical Co. in 1959 reached an agreement whereby Southern Oxygen became the exclusive distributor of argon produced by Spencer at its Vicksburg, Miss., Works. Spencer produces and markets liquid and gaseous carbon dioxide and cylinder ammonia. Spencer is a diversified chemical company with interests in agricultural chemicals, fertilizers, industrial chemicals, plastics, nuclear fuels, and coal. Spencer sales in the year ending June 30, 1960, were $74 million. Southern Oxygen produces and markets a complete line of compressed gases.

BUYS NEW ASSETS

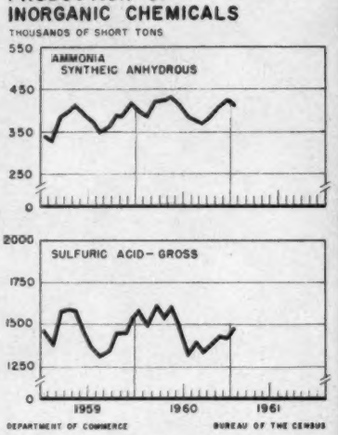
MIDDLEPORT, N. Y. — Niagara Chemical Division of Food Machinery & Chemical Corp. recently acquired certain assets of the Standard Agricultural Chemical Co. including a line of dinitro pesticides. Standard is well known in the agricultural chemical industry as a producer of dinitro herbicides and fungicides.

Increases Reported For 1960 Fertilizer Raw Materials

WASHINGTON—Production of a number of chemical fertilizer raw materials was up in 1960 over that of 1959, according to a report just issued by the U.S. Department of Commerce, Bureau of the Census. The same was largely true of production of these same materials in January, 1961, over the same month of 1960, the report says.

Here are some of the figures released on various products:

Anhydrous ammonia production in January, 1961, was 410,285 tons, as



compared to 396,403 tons in January of the previous year.

Ammonium nitrate, original solution, was also up. The figure for January, 1961, was 280,024 tons; that for January, 1960, was 278,030.

Nitrogen solutions, including those mixtures containing urea, increased in January, 1961 from that of the same month a year earlier. The respective figures were 65,702 and 63,783 tons.

Phosphoric acid production was up in January, 1961. Totals were 192,624 tons in 1961 against 162,443 tons in January, 1960.

Gross production of sulfuric acid, however, slipped in January, 1961 as compared to that month a year

Turn to PRODUCTION page 45

Becomes Consultant for Southwest Potash Corp.

NEW YORK—Kenneth D. Jacob, specialist in fertilizer technology, has joined Southwest Potash Corp. as a consultant, Thomas W. Childs, president, announced recently. Southwest Potash is a division of American Metal Climax, Inc.


K. D. Jacob

Mr. Jacob retired earlier this year as special assistant to the director of the soil and water conservation research division of the U.S. Department of Agriculture. He became engaged in fertilizer research work in 1919, when he entered federal employment, and since that time has served continuously in this field. He is the author of numerous articles dealing with the chemistry and technology of fertilizers and fertilizer materials.

Mr. Jacob is past president of the Association of Official Agricultural Chemists. In 1958 he received the Harvey W. Wiley Award of the AOAC. He also received the Superior Service Award, U.S. Department of Agriculture in 1947 for his research on phosphate fertilizers.

mighty good eating...for crops

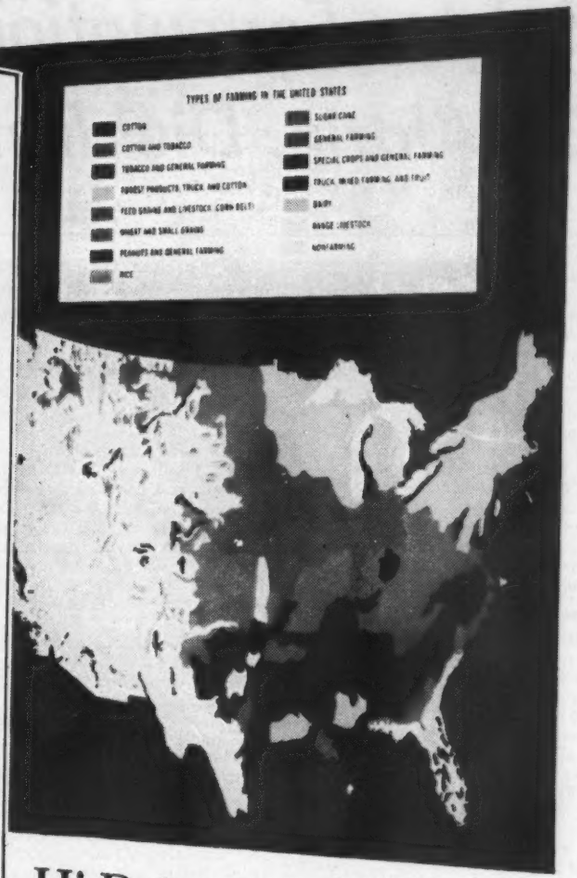
the ammonium nitrate that's granular

Whatever your crops, whatever your soil, when you need supplementary nitrogen, ask for Hi-D® Ammonium Nitrate. We believe you'll find it the most satisfactory crop and profit booster you ever used.

Hi-D always flows freely. It's made that way by a patented process. The result is granular material that's super dry. Hi-D has much less tendency to pick up moisture. It stays dry until you're ready to use it. And Hi-D will not gum up, will not clog, will not cake, will not bridge in your spreader.

Join the thousands of farmers who have switched to Hi-D. But remember, first test your soil, lime if necessary, and follow with the mixed fertilizer your dealer recommends. Then add the supplementary boost of Hi-D . . . 33.5% nitrogen. Ask your dealer for it by name.

COMMERCIAL SOLVENTS CORPORATION, AGRICULTURAL CHEMICALS DEPARTMENT, ATLANTA, SHREVEPORT, ST. LOUIS, CHICAGO, NEW YORK



Hi-D boosts all crops

it's the ammonium nitrate that's granular

he main crops raised in the United
e shown above. Most probably,
cluded, too. We believe that what-
crop, whatever your soil, you'll
Ammonium Nitrate the most
ry crop booster you ever used.
thing. Hi-D always flows freely.
by a patented process. The result
r material that's super dry. Hi-D
endency to pick up moisture. It
stays dry until you're ready to use it. And Hi-D will not gum up, will not clog, will not cake, will not bridge in your spreader.

Join the thousands of farmers who have switched to Hi-D. Please remember, though, first test your soil, lime if needed and follow through with the mixed fertilizer your dealer recommends. Then add the extra boost of Hi-D . . . 33.5% nitrogen. Ask for it by name.

L SOLVENTS CORPORATION, AGRICULTURAL CHEMICALS DEPARTMENT, ATLANTA, SHREVEPORT, ST. LOUIS, CHICAGO, NEW YORK

What Hi-D® does for crops ...Hi-D ads are doing for sales!

Hi-D boosts crops and Hi-D ads boost sales! The ads above, for example, are in full color. They will appear in Progressive Farmer, Farm & Ranch, and Successful Farming. Eye-catching, highly informative, they're sure to build increased demand for Hi-D. So be sure to have Hi-D . . . the granular ammonium nitrate . . . on hand to meet this profit opportunity.

COMMERCIAL SOLVENTS CORPORATION, AGRICULTURAL CHEMICALS DEPARTMENT, ATLANTA, SHREVEPORT, ST. LOUIS, CHICAGO, NEW YORK

Pesticide Production . . .

Solving Formulation Problems Of Aldrin, Dieldrin and Endrin

By Bertram I. Sparr
Shell Chemical Company
Division of Shell Oil Company
New York

EDITOR'S NOTE—This is another in Croplife's series of articles dealing with pesticide formulation problems. Previous features have covered heptachlor, chlordane, and "Fumazone." Additional articles will follow.

ALDRIN, DIELDRIN and endrin are potent, broad-spectrum insecticidal chemicals which readily lend themselves to the production of nearly every type of insecticide formulation encountered in agriculture. The "Do" and "Don't" pesticide formulation fundamentals given in the first article in this series (Croplife, pages 4, 5 and 41, January, 1961) apply also to the manufacture of aldrin, dieldrin, and endrin formulations. Adherence to them will assure the formulator that he is making a high-quality product and providing safe working conditions for his operating personnel.

Properties of Technical Product

Technical Aldrin, Technical Dieldrin, and Technical Endrin are sold and formulated on the basis of the percentage of actual insecticide contained in each drum. The minimum purities for the technical products now available in commerce are as follows: Technical Aldrin—90%W aldrin, Technical Dieldrin—95%W dieldrin, and Technical Endrin—95%W endrin. Actual purity is stencilled on each drum. Other pertinent properties of these chemicals are presented in Table I.

Liquid Formulations

From the standpoint of tonnage of actual insecticides, the most widely-used type of formulation is the emulsible concentrate. Because of their low cost, ready availability, and good solvency, aromatic petroleum hydrocarbons are generally used as solvents for aldrin, dieldrin, and endrin emulsible concentrates.

In selecting a particular solvent, the formulator should consider the relative importance of the following properties to the end use: 1) cold stability of products under expected exposure conditions, 2) phytotoxicity, 3) flash point, and 4) odor and staining properties.

While no hard and fast rules can be made to predict cold stability, one useful index of the solvency power for these insecticides is the aromatics content of the solvent. Generally, the richer the aromatics content of a petroleum hydrocarbon is, the colder the temperatures that emulsible concentrates or solutions can withstand without the occurrence of crystallization. With a few exceptions, such as chlordane, toxaphene, and strobane, the last statement holds for most of the chlorinated hydrocarbon insecticides now in use.

Table II gives the approximate cold stability to be expected from aldrin, dieldrin, and endrin emulsible concentrates containing solvents of varying aromatics content. Solutions with equivalent insecticide concentrations, but without emulsifier, have superior cold stability, because in emulsible concentrates a portion of the solvent has been replaced by emulsifier.

The concentration of endrin emulsible concentrates usually encountered in agriculture is 1.6 lb. endrin per gallon. When originally developed, this concentration was selected as being the optimum for convenient dilution instructions for the usages then established. The formulator should reappraise his instructions for dilution, his cold stability requirements, and the local supply situation for high-aromatics content solvents to determine the profitability of increasing the concentration of his endrin emulsible concentrates.

All aromatic hydrocarbon solvents are toxic to plants to some degree. The degree of phytotoxicity depends largely upon the application rate and the sensitivity of the plant. Aldrin, dieldrin, and endrin emulsible concentrates are normally applied at sufficiently low dosage levels so that the contained solvent is relatively nonphytotoxic.

The flash point of the solvent should be as high as possible in order to minimize fire hazard during manufacture. The use of high-flash solvents may also help reduce insurance rates. Moreover, if the Tag Open Cup flash point of the solvent is 80° F. or lower, an I.C.C. "red" label for flammable liquids is required and other limitations are imposed.

Solvents with unpleasant odors or which tend to stain should be avoided when an emulsible concentrate is being formulated for use in or around the house. For agricultural uses these properties are less important.

TABLE II. Cold Stability of Aldrin, Dieldrin and Endrin Emulsible Concentrates Related to the Aromatics Content of Petroleum Hydrocarbon Solvents

Insecticide	Concentration lb./gal. (actual)	—Approximate aromatics content, %V,— of solvent to give cold stability at: 0° F.	20° F.	32° F.
Aldrin	2	50	..	10
Aldrin	4	..	96	85
Dieldrin	1.5	96	90	85
Endrin	1.6	96	..	85
Endrin	2.0	..	..	96

TABLE III. Typical Properties of Insecticide Carriers

Carrier Classification	Deactivator Requirements, %w Aldrin & Dieldrin —Endrin— Tech. Urea	50% Urea Soln.*	Tech. HMT	40% HMT Soln.*	Highest Practical Concentrations, Actual Insecticide, %w Aldrin	Dieldrin	Endrin
Synthetic silicas and silicates	0–1	....	3–5	....	75	over 75	over 75
Attapulgite powders	1	....	4–5	....	50	75	75
Attapulgite granules	....	2	....	10	25	15	15
Montmorillonite types:							
Bentonite granules	....	0–2	....	2.5	4–5	2	2
Nonbentonite† granules	....	2–8	....	7.5–10	15	10	10
Nonbentonite† powder	1–3	....	3–5	....	25	50	50
Kaolins‡	1	....	1	....	25	50	75
Talcs‡ °	0–1	....	0.25–0.5	....	15	50	50
Pyrophyllites‡	1	....	0.25–0.5	....	15	25	50
Calcium Carbonates‡	0	....	0	....	5	25	25

*Solution of deactivator in water.
†Nomenclature used to distinguish fuller's earth type montmorillonite from bentonites.
‡Except for endrin-talc or endrin-calcium carbonate dusts, usually require addition of other carriers to improve grindability, sorptive capacity, and/or flowability.

The emulsifiers most commonly used in emulsible concentrates are blends of nonionic and anionic surfactants. On a percent weight basis, these are usually more efficient than the individual components and, therefore, allow the use of lower concentrations to give satisfactory emulsibility characteristics. Most emulsifier manufacturers now supply two or three emulsifier blends which can be used in varied combinations to prepare emulsible concentrates containing most of the more commonly used insecticides and a variety of solvents. Their use provides the formulator with considerable flexibility and a minimum inventory control problem.

It is fairly well established that the aldrin, dieldrin, and endrin concentration of stored emulsible concentrates is unaffected by the emulsifiers in common use in the insecticide industry. However, epichlorohydrin, at a concentration of 0.5%W of the finished product, should be added as an inhibitor to aldrin emulsible concentrates when long-term storage is anticipated. Certain impurities in Technical Aldrin slowly liberate small quantities of hydrochloric acid which, in turn, inactivate certain emulsifier components. Epichlorohydrin preferentially reacts with the hydrochloric acid, thereby protecting the emulsifier. Aldrin solutions without emulsifier require no inhibitor. Furthermore, neither dieldrin nor endrin emulsible concentrates require the addition of an inhibitor.

Aldrin, dieldrin, and endrin emulsible concentrates and solutions are

TABLE I. Typical Properties of Technical Aldrin, Technical Dieldrin, and Technical Endrin

Property	Technical Aldrin	Technical Dieldrin	Technical Endrin
Physical State at 77° F.	Friable, solid	Dry flakes	Free-flowing powder
Setting Point or Range, ° F.	120–140	203	Decomposes over 392
Apparent Density, lb./gal. at 68° F.	13.0	13.7	13.8
Actual Insecticide Content, %w min.	90	95	95
Chlorine Content, %w	57–59	55–56	55–57
Color	Tan to dark brown	Cream to light tan	Cream
Stability on Storage	Stable	Stable	Stable
Solubility, Actual Insecticide			
Kerosene	Over 2 lb./gal. at 32° F.	Over 0.5%w at 0° F.	6%w at 77° F.
Kerosene	Over 60%w at 100° F.	6%w at 77° F.	
Diesel Oil	26%w at 77° F.	17%w at 77° F.	11%w at 77° F.
Diesel Oil	Over 75%w at 130° F.	Over 35% at 130° F.	Over 30% at 130° F.
Heavy Aromatic Naphtha	Over 2 lb./gal. at 0° F.	Over 1.75 lb./gal. at 32° F.	Over 1.6 lb./gal. at 32° F.
Heavy Aromatic Naphtha	Over 3 lb./gal. at 20° F.	Over 45%w at 125° F.	Over 30%w at 130° F.
Heavy Aromatic Naphtha	Over 4 lb./gal. at 32° F.		
Heavy Aromatic Naphtha	Over 75%w at 130° F.		
Xylene	Over 2 lb./gal. at 0° F.	Over 1.5 lb./gal. at 0° F.	Over 1.6 lb./gal. at 0° F.
Xylene	Over 4 lb./gal. at 20° F.	37%w at 77° F.	39%w at 77° F.
Xylene	73%w at 77° F.		
Shell Cyclo-Sol® 53	Over 3.3 lb./gal. at 0° F.	Over 1.75 lb./gal. at 0° F.	Over 1.6 lb./gal. at 0° F.
Shell Cyclo-Sol® 53	Over 4 lb./gal. at 20° F.	Over 2.25 lb./gal. at 32° F.	
Velsicol AR-50	Over 4 lb./gal. at 32° F.	Over 1.5 lb./gal. at 0° F.	Over 1.6 lb./gal. at 0° F.
Velsicol AR-50		Over 2 lb./gal. at 32° F.	

TABLE IV. Manufacturing Formula for 75% Endrin Wettable Powder

Ingredients	%w
Endrin	75.75*
Barden AG	16.15
Attaclay	5.22
Polyfon F†	2.00
Wetanol, or Duponol WA Dry	0.50
Hexamethylenetetramine (HMT)	0.38
Total	100.00

*One per cent overage of toxicant is used to insure compliance with ingredient statement. Formula is based on 100% endrin and must be adjusted for purity of endrin used. Reduce amount of Barden AG accordingly. Do not change amounts of other ingredients.
†Marasperse N, Marasperse C or Norlig MC may be used in combination with Duponol WA Dry.

normally noncorrosive to mild steel, but the emulsible concentrates are usually drummed in lined pails and drums to protect the emulsifier. Many high-baked phenolic or epoxy resin types of linings have been found to be satisfactory for this purpose. Some of those in common use are the Bradley and Vrooman 19656-M, U.S. Steel No. 55-9, Rheem No. R-874, and Ault and Wiborg No. 4A.

Emulsible concentrates containing various combinations of endrin and methyl parathion are being used on cotton. Frequently these formulations will also contain DDT. The relative concentrations of each of the toxicants are based upon the locally recommended application rates. The general principles discussed above apply in selecting solvents, emulsifiers, and containers for these formulations.

The maximum practical concentrations of endrin and methyl parathion emulsible concentrates are two pounds of each insecticide per gallon. To obtain cold stability at 32° F., a high aromatics content solvent such as xylene is required. The maximum practical concentration of mixtures with DDT is 1.6 lb. endrin, 1 lb. methyl parathion, and 2 lb. DDT per gallon. Again xylene, or its equivalent in solvency, is required to achieve cold stability at 32° F.

Endrin-methyl parathion emulsible concentrates with or without DDT have seasonal storage stability. Stabilizers are now available which can be added to these formulations to impart longer-term storage stability to them.

Aldrin, dieldrin, and endrin solutions or emulsible concentrates are prepared by dissolving the technical insecticides in a suitable solvent with the aid of agitation and adding inhibitor and emulsifiers as required.

Both Technical Dieldrin and Technical Endrin are free-flowing products and pose no problem in transferring from the drum.

Technical Aldrin is supplied as a solid, friable cake which can be easily removed from the fiber drum by stripping of the sides and ends with an axe. The cake of Technical Aldrin should then be chopped into chunks. Further reduction of size of the chunks, by use of an ice- or cob-crusher, facilitates their solution.

Where high-flash solvents are used, the solution rate can be increased by gently heating the mixture of solvent, insecticide, and emulsifiers to 110-130° F., but not exceeding the flash point of the solvent. To hasten solution and assure uniformity, the mixture should be continuously agitated with a stirrer driven by an explosion-proof motor. Before pumping the product from the kettle, it is wise to take a specific gravity meas-

urement of the batch. The gravity will reveal any gross error in formulation.

For clear, settled products, multiple cartridge filters are generally adequate. But when fast throughput rates and brilliant solutions are desired, then enclosed pressure filters are suggested.

Emulsible concentrates containing mixtures of endrin and methyl parathion should be made only in equipment suitable for handling methyl parathion or other organophosphorus insecticides, being sure to take the extra precautionary measures recommended for working with such materials.

Solid Formulations

In the selection of carriers for solid insecticide formulations, the formulator must consider the following carrier properties, since they affect the finished products and their end use as well as his own manufacturing facilities: 1) deactivation requirements, 2) practical sorptive capacity, 3) bulk density, and 4) flowability. In the case of granular carriers he must also heed local entomological usage and recommendations regarding concentration, carrier types, and particle size.

Certain general properties of common carriers such as the bulk densities and oil sorptiveness were given in the first article in this series (Croplife, January, 1961). Other properties as they pertain to the solid formulations of aldrin, dieldrin, and endrin are given in Table III, this issue.

Like most other chlorinated hydrocarbon insecticides, aldrin, dieldrin, and endrin are subject to catalytic decomposition by acid sites on the surfaces of many mineral carriers. These sites can be deactivated by urea in the case of aldrin and dieldrin, and by HMT (hexamethylenetetramine) in the case of endrin.

Generally, carriers with an acid strength of $pK_a+3.3$, or weaker, require no deactivation for aldrin and dieldrin preparations; carriers with an acid strength of $pK_a+4.0$, or weaker, require no deactivation for endrin products. However, the results of tests to measure surface acidity are frequently difficult to interpret; therefore, the formulator should use only those carriers whose deactivator requirements are known.

The deactivator requirements for many of the commonly used carriers are reported in the "Handbook of Aldrin, Dieldrin, and Endrin Formulations," second edition, (1959), Shell Chemical Co., New York, N.Y. The deactivator requirements of many other carriers are available from the suppliers of the technical insecticides and of the carriers.

Dieldrin dust concentrates and wettable powders are prepared by preblending in a ribbon mixer Technical Dieldrin flakes with the carriers, urea, and wetting agent, pulverizing the coarse mixture in a hammermill, and after-blending the ground product. When a high-suspendability wettable is being prepared, the product from the hammermill is fed directly to the air mill, and the air-milled product is after-blended. The process for Technical Aldrin dust concentrates and wettable powders is similar except that the preblender is first charged with carrier and other ingredients, and that the chunks of Technical Aldrin are added in several steps to avoid overloading the motor. Blending is continued until the Technical Aldrin particle size is reduced to ¼-in. pieces or smaller.

WINNER AWARD—Bob Homan, left, Westville, Ind., was one of 23,833 farmers who signed a Spencer Chemical Co. fertilizer "pledge" to consult their fertilizer dealer about proper plant food use. Mr. Homan emerged as the grand prize winner and will receive about 40 tons of plant food (equivalent to $2,500 top prize) for use on his 306-acre farm. In the photo, he discusses his plans with C. N. Boehlke of the Wanatah, Ind., Mercantile Co. Mr. Homan says he will try to top the 115 bu. corn yield he realized in 1960.

The procedure for manufacturing endrin dust concentrates or wettable powders is similar to that for dieldrin except that the carrier and HMT, added as a preground 50% mixture with carrier, should be intimately preblended before adding the Technical Endrin.

However, if the mixture is to be put through a hammermill immediately following blending, all the ingredients may be added to the preblender simultaneously. In any case, the formulator should use a preground 50% mixture of HMT and carrier as his HMT source.

Technical Endrin is a hard, dry product easy to grind. By prudent selection of his carriers, the formulator can often prepare high-quality products with a relatively low inert ingredients cost. The manufacturing formula for 75% endrin wettable powder given in Table IV illustrates this point. The main carrier is a kaolin and is not considered highly sorptive. However, in this formula, the sorptivity of the carrier is not so critical as it is with liquid or low-melting toxicants. As compared to the more sorptive carriers, kaolins are relatively inexpensive; and in addition kaolins have a deactivator requirement of only 1% HMT. The Attaclay, an attapulgite, with a 4% HMT requirement, is added to aid grinding and provide good flowability in processing. To obtain a high-suspendability wettable powder, air-mill the mixture after the hammermilling step.

To a degree, the same principles used to arrive at the 75% endrin wettable powder may be applied to designing aldrin and dieldrin dust concentrate and wettable powder formulations. Generally, they will require more sorptive carriers, but the formulator can enjoy some savings by determining the optimum carrier or carrier combination for his needs.

Field-strength dusts containing aldrin, dieldrin, or endrin are prepared preferably by blending a dust concentrate with nonactive or deactivated carriers in a ribbon blender. Non-

Turn to **FORMULATION** page 31

Care and Maintenance of Liquid Fertilizer Meters Important Matter During Shutdowns

Tips on care and maintenance of all-ferrous liquid meters in fertilizer processing lines, particularly during shutdown periods of more than several days, have been offered by Rockwell Manufacturing Co., Pittsburgh. The accuracy and usefulness of meters can be impaired by rust and corrosion during such shutdowns, unless preventive measures are taken to halt the action of these twin destroyers.

The main ingredient for meter protection is a rust-preventive oil with water-displacing properties. Here is the way the company recommends that meters should be protected during shutdowns:

If the meter is not removed from the line, a connection for water and air is made in the inlet line just ahead of the meter and between the meter and the meter inlet valve. Another connection for discharging is made near the meter outlet. This will prevent contaminating the downstream part of the system.

The unit should be flushed for at least five minutes with water at a sufficient rate of flow to rotate the meter. (Caution: this rate should not exceed 20% of the rated capacity of the meter.) Allow meter to drain.

Next, a rust preventive oil is sprayed or atomized through the meter. The spray is applied for about 15 minutes with pressures of the air inlet and atomizer adjusted to turn the meter at about one-fourth (but not more than one-third) of its maximum rated speed.

Any rust preventive oil with water displacement properties can be used. However, recommended oils include those that meet the specifications of MIL-C-16173a#, Grade III; MIL-C-972 (ships)—grade III; USN-52-C-18-B—Grade III, and AXS-1759, Grade II.

If it is possible and practical to remove meter from the line, a blind flange should be put on the meter inlet and tapped to receive a half-inch pipe for water and air supply.

Water flushing, draining, and oil spraying procedures are then the same as with a meter that stays in the line. If spraying is not practical, a meter that is removed from the lines can be filled with oil. It should be allowed to stand for at least eight hours before excess oil is drained. After draining, cover inlet and outlet connections to prevent dust and dirt from entering meter.

Before putting the meter back into service, the lines should be thoroughly flushed, so that no foreign particles will enter the meter.

Thus, proper maintenance and inspection of these meters will avoid trouble when they are put back into service.

J. G. Hartsig T. W. Swift

Arizona Fertilizer Advances Two Long-Time Executives

PHOENIX, ARIZ.—The board of directors of Arizona Fertilizer and Chemical Co. has elected two of its long-time executives to positions of greater responsibility.

Ted W. Swift was named a vice president of the firm, and Joseph G. Hartsig an assistant vice president.

Mr. Swift, who holds a B.S. degree from Oregon State, joined the company in 1938 as a field service representative. He was appointed sales manager in 1952, and executive assistant in charge of production in 1956. As a vice president, he will continue to supervise production for the chemical company.

Mr. Hartsig, who graduated from Arizona State with a B.S. degree in biological science, joined the company in 1948 as a lab technician. After ten years as a field service man, he became an executive assistant in charge of purchasing and product development in 1958. As assistant vice president, he will coordinate purchasing, government contracts and sales, wholesale sales, advertising and promotion.

International Paper Sales, Profit Decline

NEW YORK—For the second year sales by International Paper Co. and its subsidiaries exceeded one billion dollars in 1960, but earnings declined reflecting unfavorable conditions during the latter part of the year, it was reported recently by John H. Hinman, chairman of the board, and Richard C. Doane, president.

The company, in its 63rd report to shareholders, reported 1960 sales of $1,012,647,543, down slightly from 1959 sales of $1,030,208,695. Net earnings, however, declined more sharply, totaling $71,668,694 in 1960 as against $83,610,673 in 1959.

CONVENTION ANNOUNCED

SAN FRANCISCO, CAL.—California Agricultural Aircraft Association will hold its 1962 convention in Palm Springs, Cal., probably in January, according to an announcement by Wayland Fink, association president.

"Boss, I seem to have lost my pep."

Table 1—Fertilizers Consumed as Mixtures and as Materials, Year Ended June 30, 1960, Compared with Consumption the Previous Year by State and Region[1] (Prelim.)

State and region	Mixtures	Materials[2]	Total	
			Consumption	Change from year ended June 30, 1959
	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Maine	151	11	162	-18
New Hampshire	14	4	18	-3
Vermont	38	18	56	[3]
Massachusetts	68	15	83	-7
Rhode Island	15	2	17	[4]
Connecticut	56	16	72	-7
New England	342	66	408	-34
New York	518	75	593	-30
New Jersey	214	24	238	-17
Pennsylvania	575	81	656	-10
Delaware	87	6	93	-3
District of Columbia	4	2	6	1
Maryland	281	20	301	-11
West Virginia	64	11	75	-1
Middle Atlantic	1,743	219	1,962	-72
Virginia	647	99	746	-50
North Carolina	1,283	320	1,603	-151
South Carolina	578	206	784	-111
Georgia	1,418	312	1,730	253
Florida	1,380	179	1,559	94
South Atlantic	5,306	1,116	6,422	34
Ohio	940	119	1,059	-40
Indiana	882	271	1,153	-25
Illinois	613	869	1,482	-115
Michigan	584	81	665	-71
Wisconsin	372	49	421	-57
East North Central	3,391	1,389	4,780	-308
Minnesota	383	148	531	-17
Iowa	441	250	691	-5
Missouri	505	297	802	-131
North Dakota	49	94	143	11
South Dakota	11	24	35	-4
Nebraska	47	274	321	16
Kansas	114	220	334	44
West North Central	1,550	1,307	2,857	-86
Kentucky	461	110	571	-25
Tennessee	488	133	621	20
Alabama	804	270	1,074	-6
Mississippi	322	369	691	-11
East South Central	2,075	882	2,957	-21
Arkansas	172	190	362	3
Louisiana	162	144	306	15
Oklahoma	78	67	145	11
Texas	298	411	709	44
West South Central	710	812	1,522	73
Montana	4	40	44	3
Idaho	17	126	143	8
Wyoming	1	17	18	2
Colorado	17	74	91	2
New Mexico	2	42	44	3
Arizona	32	147	179	-17
Utah	6	24	30	-7
Nevada	2	4	6	[4]
Mountain	81	474	555	-6
Washington	41	173	214	-29
Oregon	34	170	204	4
California	337	[5] 2,432	2,769	179
Pacific	412	2,775	3,187	154
Total	15,610	9,040	24,650	-266
Hawaii	58	69	127	-11
Puerto Rico	212	33	245	-13
United States: 1959-60	15,880	[6] 9,142	25,022	-290
1958-59	16,069	[6] 9,244	25,313	0
1957-58	14,353	[6] 8,163	22,516	2,506

[1] Due to rounding, column or cross totals may not balance. [2] Includes ground phosphate rock and colloidal phosphate, basic slag, and secondary and trace nutrient materials (borax, metallic salts, sulfur, gypsum, etc.) consumed as separate materials. Does not include liming materials or the quantities of materials used in manufacture of commercial mixtures. [3] Increases in amounts less than 500 tons. [4] Decreases in amounts less than 500 tons. [5] Includes an estimated 270,000 tons of dried manures. [6] Includes materials not guaranteed to contain N, P_2O_5, or K_2O, amounting to 1,375,000 tons in 1959-60, 1,223,204 tons in 1958-59, and 939,728 tons in 1957-58.

Table 2—Principal Grades of Mixtures Consumed in United States, Year Ended June 30, ed June 30, 1960[1] (Preliminary)

Grade	Consumption	Grade	Consumption	Grade	Consumption	Grade	Consumption
	1,000 tons		1,000 tons		1,000 tons		1,000 tons
0-10-20	80	4-8-12	212	6-6-6	101	8-24-8	55
0-14-14	158	4-9-3	54	6-8-6	102	10-6-4	82
0-20-20	254	4-10-6	73	6-8-8	243	10-10-10	702
2-12-12	248	4-10-7	244	6-10-4	53	10-20-10	228
3-9-9	464	4-12-8	103	6-12-6	85	10-20-20	62
3-9-12	57	4-12-12	1,158	6-12-12	494	12-12-12	886
3-9-18	83	4-16-16	371	6-24-12	269	13-13-13	69
3-9-27	53	5-10-5	300	6-24-24	247	14-0-14	51
3-12-6	54	5-10-10	1,567	7-28-14	75	14-4-10	69
3-12-12	464	5-10-15	398	8-4-8	58	14-14-14	55
4-7-5	88	5-20-10	77	8-8-8	218	16-48-0	53
4-8-6	50	5-20-20	949	8-12-12	68	Other[2]	3,647
4-8-8	91	6-4-8	74	8-16-16	184	Total	15,880

[1] Grades consumed in amounts of 50,000 tons or more.
[2] Approximately 1,700 grades.

CONSUMPTION

Continued from page 1

the regions. Increases were noted for all states in the West South Central region while decreases were recorded in all states in the Middle Atlantic and East North Central regions.

Mixed Fertilizers

Mixed fertilizers comprised 63.5% of the total tonnage of all fertilizer products consumed and amounted to 15,880,000 tons—a decrease of 189,000 tons (1.2%) from consumption (16,069,027 tons) for the year ended June 30, 1959. In 21 states and the District of Columbia increases were recorded totaling 429,000 tons of which 336,000 tons were in Florida and Georgia. There were decreases in 28 states and Puerto Rico totaling 618,000 tons. Twenty states to the east of the Mississippi River recorded decreases and only eight to the west.

There were 50 grades recorded in amounts of 50,000 tons or more, totaling 12,233 000 tons (Table 2). These accounted for 77% of the total tonnage of mixtures and about 1,700 other grades made up the remaining 23% of the tonnage consumed. The relative use of most of these 50 grades corresponded to that of the preceding year although at a somewhat lower level.

Five of the grades—5-10-10, 4-12-12, 5-20-20, 12-12-12, and 10-10-10—were those recorded in largest amounts and their combined tonnages accounted for about one-third of the total tonnage of mixtures consumed in each year. One or more of these five grades are among the grades consumed in largest tonnages in most of the states.

Materials Consumption

Materials marketed for direct application amounted to 9,142,000 tons and comprised 36.5% of all fertilizer products used in the year ended June 30, 1960. Included in this tonnage are 7,767,000 tons of materials containing one or more of the primary plant nutrients (N, P_2O_5, K_2O) and 1,375,000 tons of materials containing only secondary and trace nutrients, principally calcium and sulfur largely in the form of gypsum.

The consumption of materials containing primary nutrients decreased 253,000 tons (3.2%) whereas consumption of secondary and trace nutrient materials increased 152,000 tons (12.4%).

The principal kinds of materials and the tonnages marketed in each region are shown in table 3. Chemical nitrogen products comprised the only class of primary nutrient materials which increased in overall use. Although most of the products listed in this class were used in lower quantities than in the preceding year, the higher use of anhydrous ammonia, urea and, in particular, the nitrogen solutions offset the decreases in quantities of the other products used.

Consumption of the natural organics was generally lower in most areas. The use of phosphate materials as a class decreased, but registered gains in the New England, West South Central, and Pacific regions. Of the listed products, consumption increased only in the ammoniated phosphates and decreased principally in basic slag and phosphate rock.

Potash materials consumed as a class decreased but recorded a small increase in the South Central region. The increased use of the secondary and trace nutrient materials was due principally to the increase in the tonnage of gypsum used in the Pacific region.

Primary Nutrients

Primary plant nutrients supplied by all fertilizer products consumed during the year ended June 30, 1960, totaled 7,571,000 tons (Table 4). This amount based on the guaranteed nutrient content of these products with allowances for overruns and underruns determined from analyses of samples reported by state fertilizer control officials, was higher than that found for the larger tonnage of products used in the preceding year. This represented an increase in primary plant nutrients of 155,000 tons (2.1%) from that (7,415,713 tons) consumed in 1958-59.

In 1959-60, consumption of nitrogen was 2,767,000 tons, an increase of 94,000 tons (3.6%); that of available P_2O_5, 2,566,000 tons—15,000 tons

(Continued on page 12)

These services (and more)

IMC TOTAL

Why limit your total opportunity

Many of the fertilizer industry's most successful manufacturers rely on IMC as a single source for their full line of raw materials* and total service.

IMC interests itself in every phase of your marketing operation . . . does something positive about it. Total Service embraces marketing assistance, sales

MARKET ANALYSIS HELP | MANAGEMENT HELP | SALES, DEALER, FARMER MEETING ASSISTANCE | ADVERTISING PROMOTION HELP | TECHNICAL SERVICES

MOST COMPLETE LINE OF FERTILIZER MATERIALS

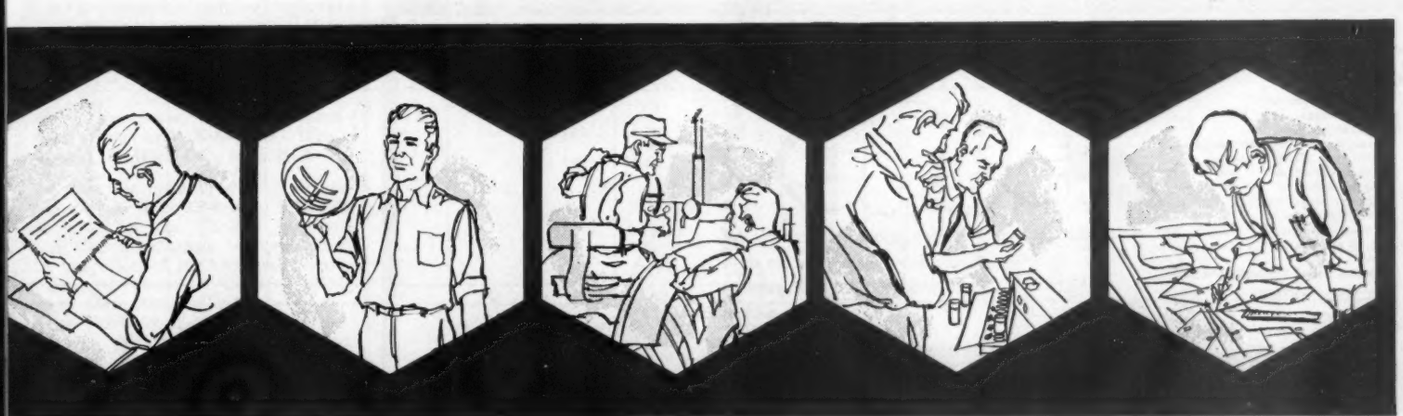
Phosphate Rock • Calcined Phosphate Rock • Triple Superphosphate (Run-of-pile, Coarse, Granular) Phosphoric Acid • Muriate of Potash (Standard, Coarse, Granular) • Sulphate of Potash • Sul-Po-Mag®

are yours with SERVICE!

with anything less?

services, management help, technical service, year-round planning, transportation, insurance, safety, and credit and collection assistance.

Why limit your potential . . . take advantage of IMC's Total Service for your fullest profit opportunity. Join forces with IMC!



YEAR-ROUND SALES PLANNING

INSURANCE AND SAFETY

CREDIT AND COLLECTION ASSISTANCE

SALESMEN TRAINING PROGRAMS

TRANSPORTATION SERVICES

AGRICULTURAL CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

ADMINISTRATIVE CENTER, OLD ORCHARD ROAD, SKOKIE, ILLINOIS,

IMC

PRODUCTS FOR GROWTH*

*TRADEMARK

FO-5-01

(0.6%) more; and that of K_2O, 2,238,000 tons—46,000 tons (2.1%) above their amounts in the preceding year. These quantities establish a record high in the nation's history, easing previous year's consumption into second place.

Mixtures supplied 1,052,000 tons (38.0%) of the nitrogen, 2,043,000 tons (79.6%) of the available P_2O_5, and 1,967,000 tons (87.9%) of the K_2O. Although the tonnage of mixed fertilizer products was slightly lower than in the preceding year, the content of primary nutrients was higher by 134,000 tons and accounted for over one-half of the increase in nitrogen and all of the increase in available P_2O_5 and K_2O. These higher nutrient contents from lower tonnage of mixtures reflect the continued upward trend in use of higher-grade mixtures.

The weighted average nutrient contents of mixtures consumed in 1959-60 were for nitrogen, 6.6%; for available P_2O_5, 12.9%; for K_2O, 12.4%; and for the total of these nutrients, 31.9%. The corresponding averages for the preceding year were 6.22, 12.54, 11.91, and 30.67%, respectively.

Primary nutrients supplied by direct-application materials comprised 1,715,000 tons (62.0%) of the nitrogen, 523,000 tons (20.4%) of the available P_2O_5, and 271,000 tons (12.1%) of the K_2O. Of these nutrients, only nitrogen was supplied in increased amounts, principally through increased use of anhydrous ammonia, nitrogen solutions, urea, and the ammoniated phosphates. Decreases in the consumption of P_2O_5 and K_2O in direct-application materials largely were associated with decreases in the direct use of basic slag, calcium metaphosphate, phosphate rock, and potassium chloride.

● ● ●

Table 3—Kinds of Fertilizers Consumed, Year Ended June 30, 1960, by Region, in 1,000 tons 1960[1] (Preliminary)

Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii, Puerto Rico	Total	
											Consumption	Change from year ended June 30, 1959
MIXTURES	342	1,743	5,306	3,391	1,550	2,075	710	81	412	270	15,880	-189
CHEMICAL NITROGEN MATERIALS	15	86	819	513	725	609	515	237	989	75	4,525	31
Ammonia, anhydrous	0	3	85	79	179	72	166	46	145	1	747	35
Ammonia, aqua	0	2/	0	7	15	3	7	23	311	42	398	-74
Ammonium nitrate[3]	7	31	157	158	312	284	127	77	78	1	1,231	-43
Ammonium nitrate-limestone mixtures	2/	1	221	2/	0	37	4	1	2/	0	264	-42
Ammonium sulfate	2/	12	5	106	9	14	80	45	239	25	535	-14
Nitrogen solutions	3	6	161	122	200	89	37	10	79	0	657	142
Sodium nitrate	2	12	224	2	2/	159	54	2/	2/	2/	453	-25
Urea	1	9	5	27	7	4	31	20	37	6	147	37
Other[4]	2	13	20	12	3	7	9	15	41	2/	122	16
NATURAL ORGANIC MATERIALS	17	34	31	35	10	3	7	7	329	2/	473	-45
Dried manures	5	11	5	7	4	2	2	1	272	0	309	-13
Sewage sludge, all	7	16	11	27	6	1	2	4	47	2/	121	-10
Tankage, all	2	5	3	1	0	2/	0	2/	1	2/	13	-6
Other[5]	3	2	12	2/	2/	2/	3	1	9	0	30	-16
PHOSPHATE MATERIALS	32	82	89	633	522	196	247	197	280	14	2,292	-222
Ammoniated phosphates[5]	2/	2	1	20	187	5	121	88	131	3	558	19
Basic slag	0	0	13	0	0	58	3	0	0	0	74	-66
Calcium metaphosphate	2/	2/	1	5	12	15	2/	2/	2/	0	35	-9
Phosphate rock & colloidal phosphate	2/	8	86	471	127	15	23	2/	2/	3	675	-163
Superphosphate: 22% and under	30	69	43	46	46	89	51	16	110	1	498	-10
" : over 22%	2/	3	2	88	149	11	44	79	20	7	403	-8
Other[5]	1	1	3	3	1	1	5	13	18	2/	48	8
POTASH MATERIALS	2	9	76	204	49	68	40	3	15	10	477	-18
Potassium chloride	1	6	33	199	49	51	38	2	8	9	396	-10
Other[5]	1	3	43	5	1	17	2	1	7	1	81	-8
TOTAL: PRIMARY NUTRIENT FERTILIZERS	408	1,956	6,321	4,776	2,856	2,951	1,519	526	1,965	369	23,647	-442
SECONDARY & TRACE NUTRIENT MATERIALS	2/	6	101	4	1	6	3	30	1,221	3	1,375	152
Gypsum	2/	5	97	1	1	5	1	22	1,162	0	1,294	134
Other[5]	2/	1	4	2	2/	1	2	8	59	3	81	18
TOTAL: ALL FERTILIZERS	408	1,962	6,422	4,780	2,857	2,957	1,522	555	3,187	372	25,022	-290

1/ States comprising the regions are listed in table 1. Due to rounding, totals of items may not add to column or class totals. 2/ Less than 500 tons. 3/ Undetermined quantities may have been used for non-fertilizer purposes. 4/ Includes quantities undesignated by kind. 5/ Includes all reported quantities of grades: 11-48-0, 13-39-0, 16-20-0, 20-52-0, 21-53-0, and 27-14-0.

● ● ●

Table 4—Primary Plant Nutrient Contents of Mixtures Consumed in Regions and United States, Year Ended June 30, 1960, by Kinds [1] [2] in 1,000 tons (Preliminary)

Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii and Puerto Rico	United States	
											Consumption	Change from year ended June 30, 1959
						Nitrogen						
MIXTURES	28	106	300	221	142	102	61	12	47	34	1,052	52
MATERIALS	5	29	208	201	361	206	253	108	325	18	1,715	42
Ammonia, anhydrous	0	2	21	65	147	59	136	38	119	---	587	28
" , aqua	0	---	0	2	3	1	1	5	62	9	83	-14
Ammonium nitrate	2	11	53	53	105	96	43	26	26	---	415	-14
Ammonium nitrate-limestone mixtures	---	---	46	---	0	8	1	---	---	0	56	-8
Ammonium sulfate	---	2	1	22	2	3	17	9	50	5	111	-4
Calcium cyanamide	---	1	2	---	0	1	2	1	1	---	8	-1
Natural organics	1	2	2	2	1	---	---	---	6	---	14	0
Nitrogen solutions	1	2	41	39	71	9	11	3	18	0	195	36
Phosphate products	---	---	---	3	28	1	19	14	21	1	87	4
Potassium products	---	---	2	---	0	---	0	0	0	0	2	-1
Sodium nitrate	---	2	36	---	---	---	26	9	---	---	73	-4
Urea	1	4	2	12	3	2	14	9	17	3	67	17
Other chemical nitrogen products	---	2	2	3	1	---	---	2	6	---	16	4
Total nitrogen	33	135	508	422	503	308	314	120	372	52	2,767	94
						Available P_2O_5						
MIXTURES	40	208	490	561	302	235	119	16	56	16	2,043	29
MATERIALS	7	19	14	79	149	41	62	71	78	3	523	-14
Ammoniated phosphates	---	1	---	10	58	2	30	25	33	1	160	3
Basic slag	0	0	1	0	0	5	---	0	0	0	6	-6
Calcium metaphosphate	---	---	1	3	8	10	---	---	---	0	23	-5
Natural organics	1	1	1	1	---	---	---	---	6	---	11	-1
Phosphate rock and colloidal phosphate[3]	---	---	1	14	4	---	1	---	---	---	21	-4
Superphosphate: 22% and under	6	14	8	9	10	18	10	3	22	---	100	-2
" : Over 22%	---	1	1	41	69	5	20	35	9	2	183	-2
Other phosphate products	---	1	1	1	---	---	---	7	8	---	19	3
Total available P_2O_5	47	227	504	640	451	276	181	87	134	19	2,566	15
						K_2O						
MIXTURES	43	198	626	526	193	234	79	3	30	35	1,967	53
MATERIALS	1	5	28	123	30	36	23	2	17	6	271	-7
Natural organics	---	---	---	---	---	---	---	---	8	---	8	-2
Potassium chloride	1	4	20	121	30	31	23	1	5	5	241	-6
Other potassium products	---	1	8	2	---	5	---	1	4	1	22	1
Total K_2O	44	203	654	649	223	270	102	5	47	41	2,238	46
GRAND TOTAL: N, avail. P_2O_5, K_2O												
1959-60	124	565	1,666	1,711	1,177	854	597	212	553	112	7,571	155
1958-59	130	575	1,562	1,765	1,146	818	552	209	542	117	7,416	0
1957-58	129	539	1,366	1,569	886 3/	726	497	196	501	103	6,512	-904

1/ States comprising the regions are listed in table 1. Due to rounding, totals of items may not add to column or class totals.
2/ Dashes (---) represent quantities less than 500 tons.
3/ Represents a weighted average of 2 percent for the colloidal phosphate and 3 percent for the phosphate rock.

California Chemical Awards Contract for Piping in Plant

SAN FRANCISCO, CAL. — J. Q. Cope, vice president, California Chemical Co., a subsidiary of Standard Oil Co. of California, has announced the awarding of a major contract to the Winger Construction Co., Ottumwa, Iowa, for the installation of underground and above-ground piping at Calchem's new Fort Madison, Iowa, fertilizer plants.

This construction work includes the basic foundations for tanks and storage facilities at this complex of chemical fertilizer plants, said to be the largest installation of its kind in the world. Completion of the Winger Construction Co. work is anticipated in August, 1961. All manufacturing facilities will be completed in late 1961, and will be operated by the Ortho Division of California Chemical Co. High analysis complex pelleted fertilizer will be marketed in the Midwest and Northeastern states.

M. F. Wharton Dies; Was Arizona Firm Executive

PHOENIX, ARIZ.—Malcolm Frederick Wharton, Sr., 65, retired partner in Arizona Fertilizers and Chemical Co., died March 23 in a Chicago hospital after a long illness.

He was also vice chairman of the Arizona Oil and Gas Conservation Commission and had been a member since its inception, having served as its first chairman.

Mr. Wharton was at one time an instructor at Purdue University, also a member of the faculty of the University of Arizona from 1924 to 1937, when he became associated with Arizona Fertilizers, from which he retired last year.

Southern Nitrogen Earnings Up

SAVANNAH, GA. — Southern Nitrogen Co., Inc., reports a 50% increase in net income during 1960. The Savannah-based company and its wholly-owned subsidiaries — Florida Nitrogen Co. at Tampa and Millhaven Sales Corp.—earned $1,253,000 last year as compared with $832,000 during 1959.

$15 Million Boost to Oregon Farm Income Credited to Use of Chemical Pest Control

SALEM, ORE.—Oregon's state department of agriculture claims that at least $15 million was added to the state's farm economy last year through the use of farm chemicals. This was based on figures of the first statewide survey of 253 licensed spray chemical applicators, 130 of whom submitted replies for a 51.4% return.

The 130 applicators estimated grower benefits from sprays applied on more than one half million acres at $8 million. S. R. Kelso, herbicide control supervisor for the department, said he believes that the returns represent close to half the total picture. He places the over-all state benefits at the $15 million figure.

Benefits come from the use of herbicides and other sprays used to control plant pests and diseases. The value to crop production was split fairly evenly between weed and other controls.

The added value to crops is after the costs of spraying were deducted. On the 130 returns, payment to applicators was $964,728.71, which led Mr. Kelso to conclude a conservative figure statewide for costs to growers at $1.5 million or one tenth of the total benefits.

The 130 applicators said that they sprayed 401,883 acres for weed control at an average cost of $1.79 per acre and 99,336 acres for pest and disease control at an average cost of $2.47 per acre. Roughly three fifths of the weed control was on grain lands, reports the department.

Young Machinery Appoints

MUNCY, PA.—The appointment of B. Clay Lee as a sales engineer for Young Machinery Co. has been announced by H. T. Young, president. Mr. Lee will be responsible for the sale of Young & Robinson type process machines and pneumatic systems throughout New York state and New England.

Committees Appointed For Midwest Assn.

OMAHA, NEB. — Organization of state committees and the appointment of committee chairmen was announced by President Herbert Woodbury at a meeting of the Midwest Agricultural Chemicals Assn. held recently in Omaha, Neb.

Mr. Woodbury said these committees are to be thoroughly conversant with state legislation affecting agriculture and especially the agricultural chemical industry in their respective states. Committee members will be available for consultation with state authorities on such subjects as recommendations for specific agricultural chemicals as they are applicable for use in their particular state. Also, where they can be helpful, they will work with state university officials in the organization of pesticide short courses for dealers and distributors.

State committee chairmen appointed by Mr. Woodbury are:

G. R. Brown, Miller Chemical Co., Nebraska; Howard W. Sheldon, Dow Chemical Co., Missouri; G. A. Lawrence, Diamond Alkali Co., Iowa; and Robert S. Wise, Robert S. Wise Co., Inc., Kansas.

A featured speaker at the Omaha meeting was Jack Dreessen, herbicide specialist for the National Agricultural Chemicals Assn., who explained the operation of the national organization and related the interests of his group with those of MACA.

Lee Stirland of the product management division, Dupont Co., was guest speaker at the luncheon meeting. He warned that a salesman's time with a customer should be time profitably spent for both and the responsibility for making it so rests with the salesman. He suggested that a salesman should spend his time more efficiently in the interest of his customer and his employer.

Open House for Plant

DUNKIRK, OHIO—Dunkirk Plant Life Fertilizer Co. recently held open house for the public in connection with completion of two new buildings. One, measuring 40 x 96 ft., will be used for offices, scale operations and fertilizer bagging. The other building, 54 x 110 ft., is a warehouse for finished goods. The firm features both bulk and bagged dry products, as well as liquid solutions. Dave Musgrave is local manager of the plant.

FUTURE FARMERS MAY NEVER GET OUT OF DEBT, ECONOMIST SAYS

AMES, IOWA—A capital investment of $200,000 probably will be required for the average Iowa farmer by 1975, Raymond R. Beneke, farm economist of Iowa State University, said recently before a conference sponsored by the agricultural committee of the Iowa Bankers Assn. in cooperation with Iowa State University.

Mr. Beneke said the investment per farm will continue to rise as the size of farms increases and the number of farmers decreases. Increasing farm size, and investments in fertilizer and machinery in addition to more intensive livestock production, will mean doubling the amount of capital needed by 1975, he said.

The increased investment required for farming will mean a change in financing. He said today's concept of working to get out of debt will be replaced by one which measures agricultural progress in terms of net worth. Many farmers will have to be resigned to being always in debt, he added. In addition to increasing indebtedness, the economist sees a trend toward more part-owner part-renter farm combinations.

The farm economist expects the average Iowa farm to fall into the 260- to 499-acre range by 1980. This would mean that in the next 20 years the number of farms would be cut in half.

18-46-0 GRANULATED

For production of high and ultra-high analysis fertilizers which cannot be produced with conventional materials.

Headquarters For ALL Phosphates Used In High Analysis Fertilizers

Production MAN of the MONTH

Herbicide Production Every-Day Challenge to St. Paul Plant Manager

SUPERVISING operations of a production facility making a wide variety of herbicides, plus some insecticidal products, presents a real challenge to Dale Barnhart, plant manager of Chipman Chemical Co.'s manufacturing unit at St. Paul, Minn. The plant keeps busy practically all year, and produces a surprising volume of chemical products. Mr. Barnhart is the key man when it comes to production of these materials.

Chipman Chemical Co., with headquarters at Bound Brook, N.J., has made weed-killing chemicals for railroad use for many years. Actually, its entry into this field dates back to 1912 when it began making soil sterilants for killing vegetation along rights-of-way. Dale Barnhart has carried on this tradition personally, having worked on spray trains for a considerable portion of his nine years of service with Chipman.

Now, however, he is definitely on the supply side in operating the St. Paul plant. Situated beside the main line used by a number of customer railroads, the plant has easy access to incoming raw materials and also finds it easy to pump finished goods into tank cars parked on the siding adjacent to the plant. Space for eight tankers at once is provided, with pipelines, pumps and connections in place for connecting without delay.

This year, Mr. Barnhart will supervise the manufacturing of 2,4-D amine and MCP amine. However, the emphasis shifts as the season moves along. In the spring, there is a market for soil sterilants, herbicides, insecticides and chemicals to control aquatic weeds. In the late summer, arsenicals for defoliation of potatoes are needed, and in the fall and early winter, seed protectants are made. The only thing approaching a "dull" time, Mr. Barnhart says, is the November-December period.

Dale Barnhart

PESTICIDE PLANT—Chipman Chemical Co.'s St. Paul plant, top photo, is scene of activity for Dale Barnhart, Production Man of the Month. In middle photo, Mr. Chipman looks over storage facilities in plant's new 60 x 80 ft. warehouse. Below, Donald Horne, Chipman district manager at St. Paul office, and Mr. Barnhart.

A matter of pride to Chipman personnel at St. Paul, is the new 60x80 ft. warehouse, completed only this spring. According to Don Horne, Chipman district manager who makes his headquarters at the St. Paul plant, the new warehouse will enable the company to quadruple its space for storage of finished goods in metal containers and in bags. The warehouse, of all-steel construction with concrete floor, has loading docks on two sides and also access to the rail siding.

Underground, beneath part of the warehouse, is the plant's 30,000 gal. manufacturing tank, connected to storage tank outside.

Mr. Barnhart's responsibilities are many and varied. He is in charge of manufacturing, shipping and receiving, and operates a small control laboratory as well. During the busy season, he has a number of men working under his direction.

On the personal side, the production man of the month is a sportsman and regards fishing and hunting as being among his best-liked activities outside of business hours. In the winter he participates in league bowling. Mr. Barnhart is married and makes his home in St. Paul not too far from the plant.

NEW EUROPEAN PLANT

DENVER, COLO. — Gates Rubber Co. has announced construction of its first manufacturing plant in Europe, as a highlight of the firm's 50th anniversary to be observed in 1961. The new plant, containing 126,000 sq. ft. floor space, will be erected in Erembodgem, Belgium. Its products in the U.S. include collapsible "fold away" rubber tanks for transporting liquid fertilizers.

How Union-Camp's 5-Star Plan saved multiwall bag user over $130,000 a year

Making things the same can sometimes make a whale of a difference. Particularly in a multiwall bagging operation. The Smith-Douglass Company, Inc., of Norfolk, Virginia proved it recently when they put Union-Camp's 5-Star Plan into action. The difference—in annual packaging savings—came to over $130,000 a year!

Standardize = Economize

Initial 5-Star Plan surveys at Smith-Douglass' six plants revealed that *standardization* held the key to major cost reductions. Three plants used sewn open-mouth multiwall bags. One used sewn valve bags. The remaining two plants used both types of bags.

Union-Camp's multiwall specialists showed that $30,000 a year could be saved by converting all six plants to sewn open-mouth bags and using open-mouth bag filling machines.

5-Star Plan in action. Plant surveys made by Union-Camp multiwall specialists paved the way for the major packaging savings described here.

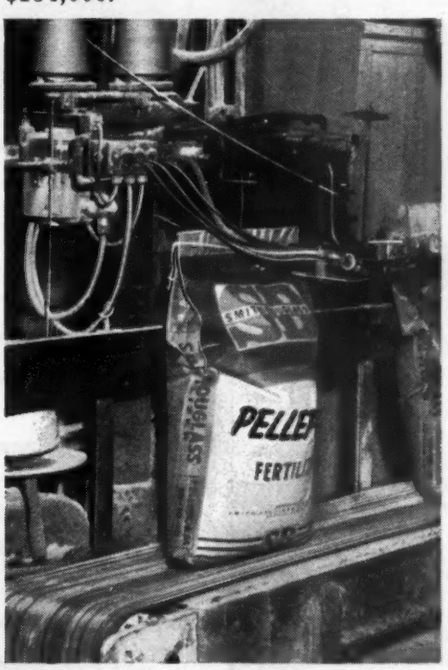
That was only the beginning. By carrying the change-over one step further, and standardizing on *size* and *construction* of multiwall bags, the company would save another $22,000 a year.

1 Design Replaces 160

Next, Union-Camp's survey team analyzed the company's existing bag *designs*. They found there were about 160 designs being used. Here, again, standardization was recommended.

By creating one basic design, eliminating an expensive yellow outer sheet, and using the same printing copy for all bags, the company netted additional economies of $84,000 a year.

$30,000 plus $20,000 plus $84,000. Total annual packaging savings—$134,000.



$30,000 a year savings resulted from converting to sewn open-mouth multiwalls in company's six plants.

How Much Could You Save?

Hundreds of companies—large and small—reduce their multiwall packaging costs by taking advantage of Union-Camp's 5-Star Plan. This comprehensive service is free. It covers bag design, bag construction, specifications control, packaging machinery and a survey of your materials handling operation. An improvement in any one of these areas conceivably could result in substantial economies for you.

See your local Union-Camp man for complete details.

This basic bag design, now used for all Smith-Douglass brands, reduced company's multiwall costs by $84,000.

FREE 16-PAGE BOOKLET

Write Dept. M-4 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall packaging operations.

UNION-CAMP
MULTIWALL BAGS
Union Bag-Camp Paper Corporation 233 Broadway N.Y. 7, N.Y.

INDUSTRY PERSONNEL NEWS

Sohio Names R. I. Pisle

LIMA, OHIO—The Sohio Chemical Co. has recently announced that Russell I. Pisle has assumed his new duties as staff assistant to James W. Bibbins, agricultural sales manager.

Russell I. Pisle

Mr. Pisle joined Sohio in March, 1955, as an agricultural salesman. He is a graduate of Iowa State University where he majored in agronomy. Mr. Bibbins announced that Mr. Pisle has been replaced in the Ohio sales territory by T. P. Mericle, who was formerly assigned as agricultural salesman in the southern territory.

●

Joins Sulphur Firm

NEW YORK—Arthur Gloster has joined Texas Gulf Sulphur Co. as assistant manager of research, the company has announced.

Mr. Gloster has been chief engineer of Titlestad Corp. for the past five years and has specialized in the design of sulphuric acid plants. From 1935 to 1955 he was associated with Chemical Construction Corp., where he was engaged in the design and construction of chemical plants, becoming assistant chief engineer.

Amoco Names Two

CHICAGO—Dr. Frank A. Cassis has been appointed director—sales technical service planning for Amoco Chemicals Corp., and Robert G. Weisz has been named supervisor—sales technical service laboratory, Laurel G. Parkinson, general manager—marketing, has announced. Both Dr. Cassis and Mr. Weisz will continue to be located at the sales technical service laboratory in Chicago.

Both Dr. Cassis and Mr. Weisz joined Amoco Chemicals in 1958 as group leaders in the sales technical service laboratory. Dr. Cassis previously had been a project chemist in the Whiting research laboratories of Standard Oil Co. (Indiana). He was graduated from West Virginia University with B.S. and M.S. degrees in chemistry in 1948 and 1949, respectively. He received a Ph.D. in chemistry from Michigan State College in 1952.

Mr. Weisz was previously employed in the product application section of the Texas City laboratory of The American Oil Co. He received a B.S. degree from Texas Technological College in 1952.

●

Two Stepan Appointments

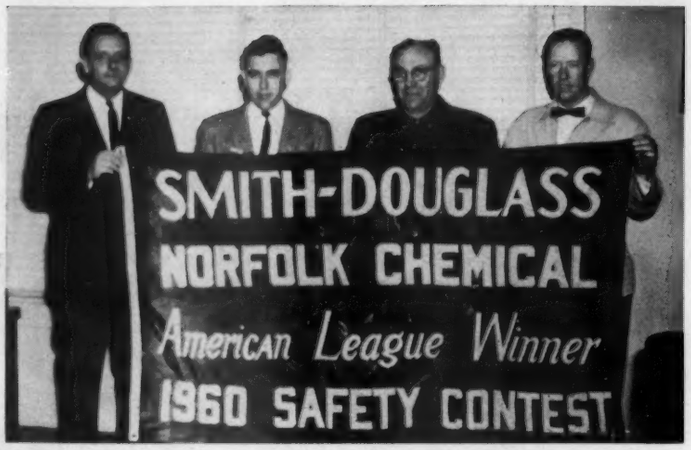
NORTHFIELD, ILL. — Stepan Chemical Co. has announced the appointment of C. Bruce Brown and Dr. Ralph Fredrickson to its special projects group.

Mr. Brown, formerly executive vice president of St. Paul Ammonia Products Inc., St. Paul, Minn., has 29 years background in the chemical industry, which includes experience in design, construction, maintenance, operation, plant development, sales, purchasing, traffic and general management.

Dr. Fredrickson, a chemical engineer, comes to Stepan from A. E. Staley Mfg. Co., Decatur, Ill., where he was director of engineering research. Before that he had been with Minnesota and Ontario Paper Co. and E. I. duPont de Nemours & Co., Inc.

The company also announced the resignation of Dr. David B. Hatcher as executive vice president, effective March 1. Dr. Hatcher indicated he plans to remain in the chemical industry in non-competitive fields.

Stepan, a producer of basic and intermediate chemicals, operates plants at Millsdale, Ill., and Maywood, N.J.



SAFETY BANNER—The Norfolk plant of Smith-Douglass Co. recently received a banner as "American League 1960 Safety Contest Winner" for having earned the highest number of points in each of three leagues in the contest. Points are based on the number of safety meetings held, number of fire drills, weekly inspections, and man hours worked. Norfolk program was initiated by J. F. Short, superintendent of chemical division. In photo are W. B. Gibbs, plant engineer; Mr. Short; R. J. Boer, garage supervisor; and E. F. Combs, personnel and safety supervisor.

●

Joins Geigy Field Staff

ARDSLEY, N.Y. — Bill Hightower has been appointed to the south central district field sales staff of Geigy Agricultural Chemicals, Division of Geigy Chemical Corp.

Bill Hightower

He comes to Geigy from the technical sales department of Velsicol Chemical Corp. where his territory was Mississippi and Tennessee. Previously he had been with the Black Leaf Division of Diamond Alkali Co. and with the Agricultural Division of Delta Air Lines.

Mr. Hightower graduated from Mississippi State University in 1952. He is married, has two children and his home is in Greenwood, Miss.

●

Vulcan Appointment

SAN LEANDRO, CAL.—Robert B. Newman has been named vice president of Vulcan Containers Pacific, Inc., San Leandro, Cal., according to an announcement by Gordon D. Zuck, president.

Robert B. Newman

Mr. Newman is a native of Chicago, Ill. and a graduate, with a bachelor of science degree, from the Illinois Institute of Technology. He also attended the University of Michigan—business administration and engineering school.

Vulcan has a new modern steel pail manufacturing plant in San Leandro, one of seven modern manufacturing plants of Vulcan-Associated Container Companies, Inc. Executive offices at Birmingham, Ala.—other plants at Bellwood, Ill.; Dallas, Texas; Peabody, Mass.; Toronto, Ontario and Vancouver, B.C., Canada.

Federal Appoints Two

Roland Winter — James Edwards

LOUISVILLE, KY.—Federal Chemical Co. has announced the appointment of sales and production managers for its newly-acquired Whitewater, Wis., plant.

Roland Winter, who has been in charge of northern Illinois sales for Federal and manager of its Rockford, Ill., warehouse, has been named division sales manager, and James Edwards, for the past seven years general foreman of Federal's Louisville, Ky., plant, has been appointed production manager at Whitewater.

●

Joins Raymond Bag Sales

MIDDLETOWN, OHIO—Raymond Bag Corp. has announced that Jerry Agin has joined its sales organization and will be working out of the company's Louisville office, covering the territories of southern Ohio, Indiana, and eastern Kentucky.

Jerry Agin

Before becoming associated with Raymond Bag, Mr. Agin was connected with the Formica Corp. and the Burgeson Metals Co. in Minneapolis, Minn.

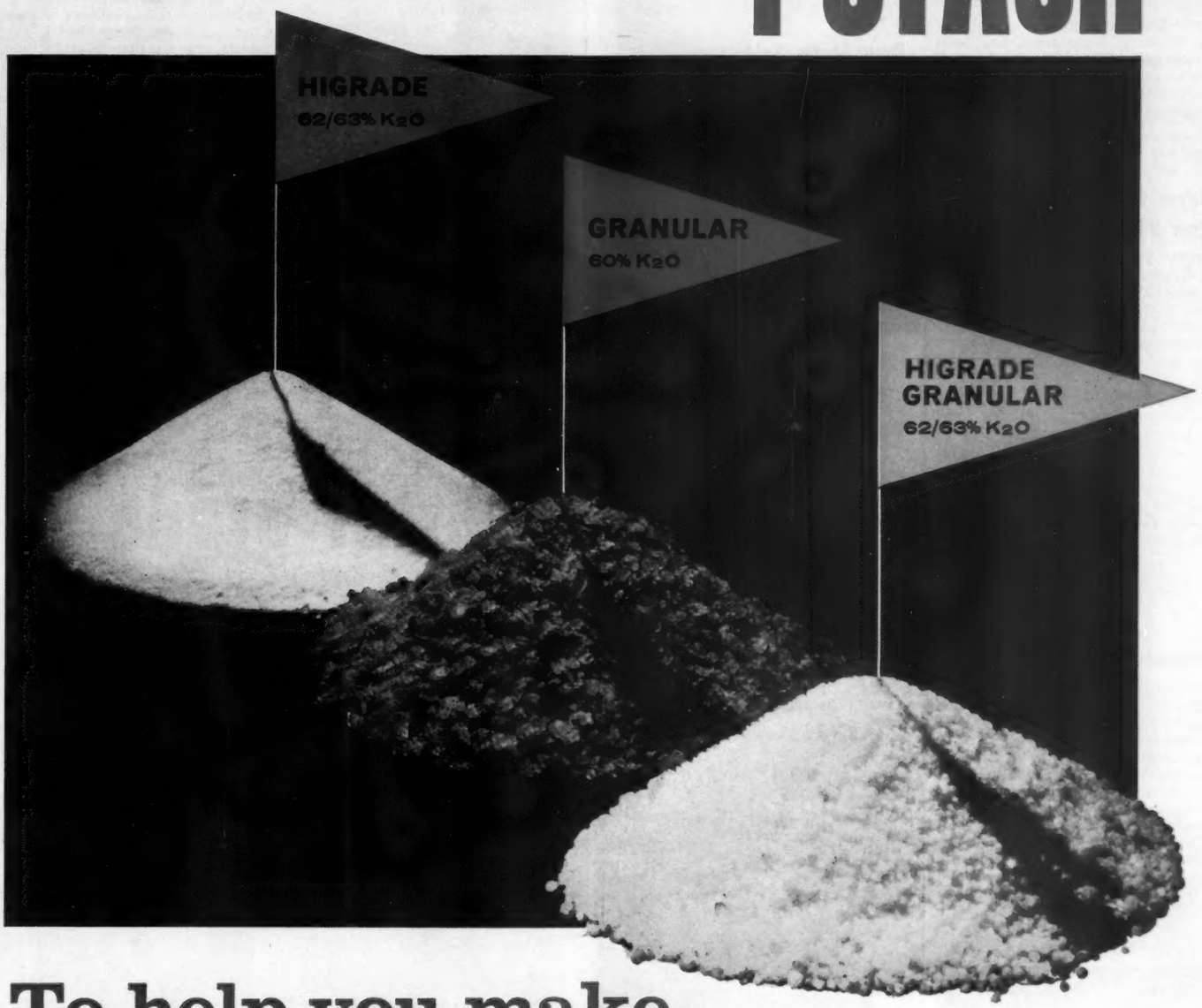
●

Chemagro Appointments

KANSAS CITY, MO.—F. R. Johnson has been named general sales manager of Chemagro Corp., Kansas City, it was announced by Hugh H. Swink, vice president, marketing. He also revealed that additional sales representatives have been appointed to augment Chemagro's national sales organization, a move necessitated by the introduction and marketing of new agricultural chemical products.

Mr. Johnson, formerly assistant director of sales, is a graduate of the University of Missouri, with a bachelor of science degree in agriculture and a master's degree in soil chemistry. He is a member of the American

For you--3 types of specially sized POTASH



To help you make the best fertilizers...

Here is potash you can depend upon—for highest quality—for maximum freedom from caking in storage and handling. Take your choice of three types; all readily available for immediate shipment. You'll find each to be ideally sized to meet your current manufacturing requirements.

For more than a quarter of a century, our potash products have kept pace with all the exacting specifications of the fertilizer industry. That's why you can count confidently on getting exactly the kind of potash you want...when you want it... from the U. S. Borax & Chemical Corporation.

Expert technical assistance is yours for the asking—without any obligation. Write today for technical data and shipping information.

Now Available!

FERTILIZER BORATE-65

...A NEW SOURCE OF BORON TO SAVE YOU MONEY!

Here's boron at lowest cost per unit! This highly concentrated source of B_2O_3 has a 178% borax equivalent. It can save dollars for you on costs of handling... storage... and transportation. It can also improve the physical condition of your mixed fertilizers.

Order Fertilizer Borate-65 now!

50 Rockefeller Plaza, New York 20, N.Y.

Sales Offices in:
ATLANTA • CHICAGO • LOS ANGELES

U.S. BORAX®

Phytopathological Society and the American Society of Agronomy.

Chemagro has also announced the following additions to its sales staff: G. A. Smith and R. Carter Breed, field sales representatives; T. J. Tatterson, technical sales representative, eastern region, and Billy D. Jones, field sales representative, southern region.

L. P. Quattrochi, formerly with the field research department, has been transferred to the central region as a technical field representative, and Thomas J. Lorenz has been named assistant to the general sales manager.

●

Retires from Olin After 33 Years' Service

NEW YORK—William Block, 56, has retired from Olin Mathieson Chemical Corp., it was announced by John O. Logan, vice president and general manager of the corporation's chemical division.

Mr. Block, vice president and manager of the Chemical Division's Blockson operations, joined Blockson as a salesman after graduating from the University of Illinois in 1928.

Blockson Chemical Co. was founded by John W. Block and his three sons, Louis, Edward and William, in 1926. The company merged with Olin in 1955. The late Edward Block, William Block's brother, was senior vice president and general manager of Olin's Chemical Division at the time of his death last January.

●

Entomologist Retires

WASHINGTON—M. P. Jones, extension entomologist with the U.S. Department of Agriculture, has announced his retirement after 37 years of government service. The effective date was March 13, 1961. In his farewell letter to extension entomologists throughout the country, Mr. Jones stated that illness in his family was responsible for his decision to step down. He said that future plans are uncertain, but he would continue for some time to reside at 412 N. Norwood St., Arlington 3, Va.

●

Alvin L. Wistert

Wm. E. Wehner, Jr.

Owens-Illinois Names Trio

TOLEDO, OHIO — The Multiwall Bag Division of Owens-Illinois Glass Co. has expanded its sales organization by the addition of three new sales representatives, J. R. Murphy, general sales manager, has announced.

K. J. LaMontagne

Alvin L. Wistert has been assigned to the western sales region with headquarters in Chicago, William E. Wehner, Jr., to a new sales territory covering southern Ohio, southern Indiana and Kentucky with headquarters in Louisville, and Kenneth J. LaMontagne to the eastern region in New York.

Mr. Wistert, an All-American tackle at the University of Michigan in 1948 and 1949, has been in industrial sales work in Detroit for the past six years.

Mr. Wehner has been connected with multiwall bag sales for the past seven years in Atlanta.

Mr. LaMontagne, former owner of the Valdosta Millwork and Cabinet Co., moves to New York from the Georgia city.

●

Dow Shifts Salesmen

MIDLAND, MICH. — Dow Chemical Co. has announced the transfer of William F. Fisher to the company's sales office in Minneapolis. He was formerly in the Houston territory for three years. Mr. Fisher will be replaced in Houston by E. Eugene Meek.

Jack Higginbotham, recently graduated from Dow's sales training program, has been made a field salesman of agricultural chemicals, according to C. F. Reed, sales manager of the Houston office.

Geigy Names Biochemist

ARDSLEY, N.Y. — Geigy Agricultural Chemicals, division of Geigy Chemical Corp., has announced the appointment of Dr. C. D. Ercegovich as staff biochemist. He comes to Geigy from Tennessee Corp., College Park, Ga. His specialty has been in the field of agricultural fungicides with main emphasis on copper compounds. He also has conducted research in the field of industrial fungicides and nematocides.

Dr. Ercegovich

Dr. Ercegovich received his Bachelor of Science degree from Iowa State University, his Master of Science and Doctor of Philosophy degrees from the Pennsylvania State University and in 1952 he was a George Westinghouse Fellow at Massachusetts Institute of Technology. He is a member of the American Chemical Society, the American Phytopathological Society, and a member of several honorary societies.

●

Hooker Chemical Elects 3

NEW YORK, N.Y. — Three new principal executive officers of Hooker Chemical Corp. were elected at the recent organization meeting of the board of directors in New York City.

Thomas E. Moffitt, company president since November, 1957, was elected chairman of the board and chief executive officer. Succeeding him as president is F. Leonard Bryant who had been executive vice president. Thomas F. Willers, formerly a vice president of the corporation, now becomes executive vice president.

Mr. Moffitt first joined Hooker in 1930, following some years of engineering activities in the Northwest. Mr. Bryant came with Hooker in 1935, and Mr. Willers in 1941.

W. C. Kaesche New President of Collier

LOS ANGELES, CAL. — Wm. C. Kaesche has been elected president of Collier Carbon and Chemical Corp., it was announced March 29. Mr. Kaesche, previously executive vice president, succeeds Robert T. Collier who moved up to chairman of the board of directors.


W. C. Kaesche

Dudley Tower, president of Union Oil Co., was elected a member of the board of directors to fill the vacancy created by the retirement of the former chairman, W. L. Stewart, Jr.

Paul Foreman, formerly treasurer and assistant secretary, replaces Howard W. Wright as secretary. Mr. Wright continues as a member of the board. Two new corporate officers, Jay Linderman and Ray Farthing, were also named. Mr. Linderman, now treasurer, and Mr. Farthing, now assistant secretary, will fill the two positions previously held by Mr. Foreman.

Collier announces the continuation of its expansion program with the recent acquisition of Pacific Guano Co., a marketer of chemical fertilizers and insecticides in California, Arizona, and Nevada.

●

Joins Wheelabrator Corp.

MISHAWAKA, IND. — Richard G. Genton has joined Wheelabrator Corp., dust and fume control division, Mishawaka, Ind., and has been assigned to a three-state territory including California, Nevada and Arizona. He will serve as regional dust and fume engineer, operating from Wheelabrator's Los Angeles and San Francisco offices.

ASA Elects Secretary

MADISON, WIS. — Dr. Matthias Stelly, formerly professor of soils at Louisiana State University, has been named executive secretary of the American Society of Agronomy, effective on April 1, 1961. The appointment was announced by Dr. B. R. Bertramson, president of the ASA and chairman of the agronomy department at Washington State University. Affiliated with the ASA and included in the membership are the Crop Science and Soil Science Societies of America. The membership of 4,350 is made up of soils and crops research scientists, teachers, extension personnel and conservation specialists, as well as agronomists in such agriculturally related industries as seed and fertilizer production and food processing. The membership includes scientists in more than 80 other countries.


Dr. Matthias Stelly

Dr. Stelly succeeds L. G. Monthey who had served as ASA executive secretary since January, 1948 and who is now employed as extension resource development specialist with the University of Wisconsin.

●

Two Promotions Made by California Manufacturer

LATHROP, CAL.—Two promotions of executive personnel have been announced by W. L. Garman, vice president in charge of sales of the Best Fertilizers Co. of Lathrop.

Al Nilsen has been named engineering advisor, and will have the responsibility of devising a program for standardization of the mechanics of applying and handling agricultural chemicals. Mr. Nilsen, a graduate of the California State Polytechnic College, has developed and simplified defoliant and insecticide spray equipment, of dry fertilizer application equipment, gypsum metering equipment, soil nematocide metering and application equipment.

Dr. Garman also has named Lisle W. Garner to the newly created position of assistant sales manager in charge of agricultural chemicals. Mr. Garner will be responsible for the expanded development of this department which was inaugurated by Best about a year ago. He has been associated with agricultural chemical production and sales management for many years in western U.S.

●

To Amoco Position

CHICAGO—James F. Mayer has been appointed a group leader at the Amoco Chemicals sales technical service laboratory, according to Laurel G. Parkinson, general manager—marketing. Mr. Mayer was previously a chemical engineer on the staff of the laboratory.

●


A. N. Weeks E. M. Proctor

A. N. Weeks Retires From Bemis; Successor Named

ST. LOUIS, MO.—A. N. Weeks, vice president and director of production of the Bemis Bro. Bag Co. and a member of the firm's board of directors, retired recently after a career dating back to 1919. He will be succeeded by E. M. Proctor, who served as assistant director of production for the company since last September. Prior to that, Mr. Proctor was manager of production for the firm's western operations. He has been with the company since 1926.

When Mr. Weeks joined Bemis in July, 1919, he was a clerk on the cable desk in the company's Boston office, following two years of World War I service. He later established the company's burlap research and grading department and in 1938 was named manager of the Bemis multiwall paper shipping sack plant at East Pepperell, Mass. In 1956, he transferred to the Bemis general offices in St. Louis, as director of production for the entire company. He was elected a Bemis vice president in February, 1958, and to the board of directors a year later.

WHAT'S NEW

IN PRODUCTS · SERVICES · LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 9344—Vibrator Wedge Mount

Martin Engineering Co. offers a new locking wedge mount which the makers say eliminates the problem of "creep-out." The device attaches securely to hopper car chutes without the need for blows from a sledge

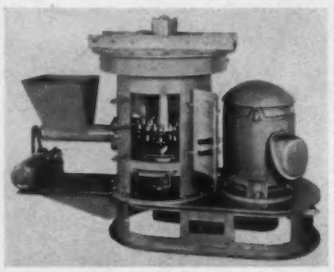
hammer. The makers claim that the firm, positive lock-in of the wedge mounting assures better transmission of vibration. Removal of the mount is accomplished with a hammer blow. Full details on the vibrator mount are available by checking No. 9344 on the coupon, and mailing.

No. 9345—New Bag Closure Equipment

West Virginia Pulp and Paper Co. has announced that both manufacturers and users of multiwall paper bags will be able to apply in their plants a new 4-ply double strength sewn closure "ImpacTape" to strengthen the sewing line of the bag. Modification equipment for existing units is being made available by the company, it says. The tape method of reducing bag breakage was introduced recently by West Virginia Pulp & Paper Co. Full information on the modification equipment is available by checking No. 9345 on the coupon and mailing.

No. 9350—Small Capacity Pulver Mill

A smaller version of its 5,000-lb.-an-hour mill has been introduced by Sturtevant Mill Co. The smaller unit, a 15-inch, 25-horsepower impact mill capable of producing in the hundreds of pounds an hour range (up to a

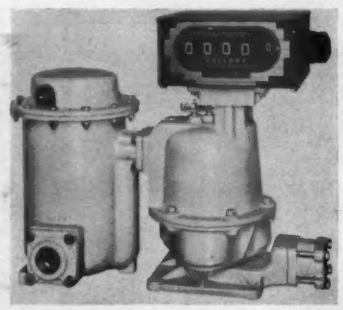


ton and a quarter). The new mill, according to the makers, offers a patented double-impactor grinding, deflector wall construction and adjustable air classification to allow precise end product selection. Complete details of the pulver impact mill are available by checking No. 9350 on the coupon and mailing.

No. 9355—Liquid Fertilizer Meter

A new positive displacement type meter, designed to measure liquid fertilizer in mixing plants, on delivery trucks and field applicators, has been developed by the Tokheim Corp.

The new device is described as a

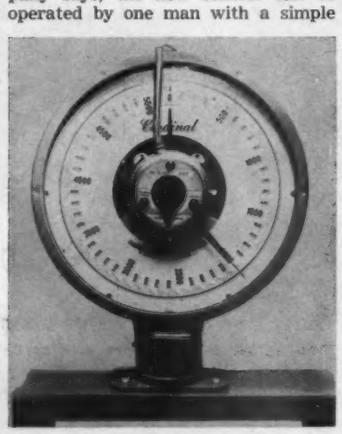


self-purging unit, built to handle liquids at speeds up to 60 gallons a minute. The meter is claimed to be accurate at any speed within its range and at any pressure.

The makers state that vital parts of the meter are built of stainless steel and other non-corrosive materials. The meter may also be used for measurement of gasoline, water and scores of other common liquids without damage to the meter, the makers claim. The basic model consists of the meter with horizontal counter, strainer, air release and back pressure valve. A pre-determiner and ticket printer are available if desired, the makers state. Counter registers to 10,000 gallons per delivery; and the totalizer to 1,000,000 gallons. For full details on the meter, check No. 9355 on the coupon and mail.

No. 9349—Cut-off Control for Scales

Cardinal Scale Manufacturing Co. has announced a new "Microset" weight cut-off control for all dial type scales. When installed, the company says, the new control can be operated by one man with a simple



dial setting and the pressing of a button. The device can be equipped with a single stage cut-off, or two-stage cut-off, and has maximum versatility, according to the makers. Optional circuit arrangements can be provided to fit almost any need, it is claimed. For further information on the cut-off control check No. 9349 on the coupon and mail.

No. 9348—Testing Sieve Specifications

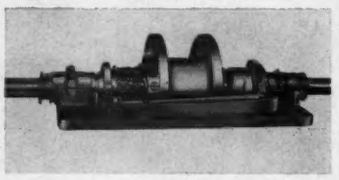
A bulletin covering 1960 revised specifications for testing sieves is offered by the W. S. Tyler Co. The bulletin, embodying the new ASTM specifications E-11-60-T as well as specifications proposed as Interna-

tional Standards, is being made available by the company.

According to Tyler, the new specifications combine the former coarse and fine series into a single series compatible with the old U.S. series E-11-39. Tyler states further that both the old and new series are also compatible with its standard screen scale series. Further information and a copy of bulletin No. 608 describing testing sieves made to the new specifications, are available by checking No. 9348 on the coupon and mailing.

No. 9346—Automatic Power Shovel

An automatic power shovel for unloading bulk materials from railway cars or long truck trailers has been announced by Webster Manufacturing Co., Inc. The shovel is suitable for handling bulk fertilizer materials,

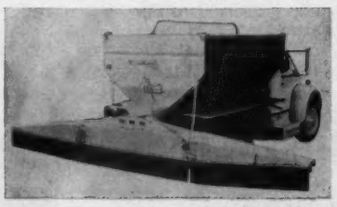


the makers say. It can be used with wood, aluminum or steel scoops.

The shovel mechanism is available in single and double types. It is mounted on a rigid support ten to twelve feet above cardoor level, and the shovel is designed for maximum travel of 35 feet. This length can be extended on special models, however, the makers say. Among other claims made for the device is a reversing system and a centrally located winding drum, single direction type. The device is claimed to have a minimum of working parts, and weight of the single unit type is 575 pounds. For further details on the power shovel check No. 9346 on the coupon and mail.

No. 9347—Fertilizer Spreader

A new bulk fertilizer spreader which, according to its makers, is engineered to increase spreading accuracy and lessen maintenance and service problems, has been announced by Simonsen Manufacturing Co. Des-



Send me information on the items marked:

- ☐ No. 9344—Vibrator Wedge Mount
- ☐ No. 9345—New Bag Closure Equipment
- ☐ No. 9346—Automatic Power Shovel
- ☐ No. 9347—Fertilizer Spreader
- ☐ No. 9348—Testing Sieve Specifications
- ☐ No. 9349—Cut-Off Control for Scales
- ☐ No. 9350—Small Capacity Pulver Mill
- ☐ No. 9351—Variable Speed Transmission
- ☐ No. 9352—Attrition Mill Catalog
- ☐ No. 9353—Polyethylene Sealing Method
- ☐ No. 9354—New Hand Truck
- ☐ No. 9355—Liquid Fertilizer Meter
- ☐ No. 9356—Face Shield and Safety Hat
- ☐ No. 9357—Portable Belt Conveyor
- ☐ No. 9358—Liquid Fertilizer Spreader

(PLEASE PRINT OR TYPE) COUPON NOT VALID AFTER 60 DAYS

NAME .....

COMPANY .....

ADDRESS .....

CLIP OUT—FOLD OVER ON THIS LINE—FASTEN (STAPLE, TAPE, GLUE)—MAIL

FIRST CLASS PERMIT No. 2 (Sec. 34.9, P. L. & R.) MINNEAPOLIS, MINN.

BUSINESS REPLY ENVELOPE
No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY—

Croplife

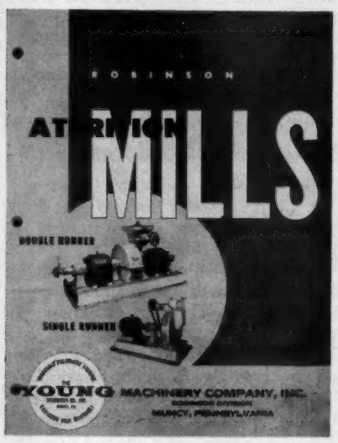
P. O. Box 67

Reader Service Dept. Minneapolis 40, Minn.

ignated as Model "P" the new spreader's features include a 16' wide, stainless steel heavy duty apron, and a stainless steel micrometer adjusting screw to allow setting of stainless steel metering gate. The makers state that the spreader is available in three spreading widths: 24, 40, and 50 feet. A single distributor fan is standard equipment on these models, with twin fans offered as optional equipment. The model "P" bulk fertilizer spreader is 10 feet long, has a capacity of 225 cu. ft. (or seven tons), and a rate of spread from 75 lb. and up per acre. Complete details are available by checking No. 9347 on the coupon and mailing.

No. 9352—Attrition Mill Catalog

A new 8-page well-illustrated technical catalog on Robinson single and double runner attrition mills has been announced by The Young Machinery Co., Inc. The bulletin covers motor and belt-driven double runner mills,



single runner water cooled mills, pressure-fed single runner mills, as well as the complete line of "Junior Disc" single runner mills for laboratory, pilot plant and small capacity operations.

The catalog gives complete dimensions, weights and capacity specifications, in addition to details on feeding mechanisms, drives, design features and specific applications. Attrition mill plates are also illustrated and described. For complete information on the product check No. 9352 on the coupon and mail.

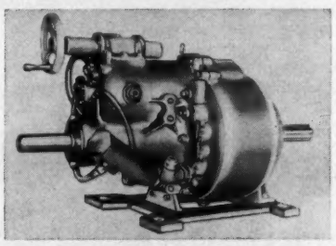
No. 9358—Liquid Fertilizer Spreader

Baughman Manufacturing Co. has developed a new liquid fertilizer spreader which operates on compressed air from self-contained unit. The new spreader features simple construction and is said to mount

quickly on regular flat bed truck or farm wagon. Contents of the tank are discharged in droplet form rather than in conventional spray, the makers say. It spreads in a width of 40 to 60 feet. The makers say that no operating parts come in contact with the liquid and drift is held to a minimum because of the "raindrop" pattern from stainless steel nozzle. Full information is available by checking No. 9358 on the coupon and mailing.

No. 9351—Variable Speed Transmission

Roberts Electric Co. offers information on its new 10-h.p. variable speed hydraulic transmission which it says permits automation and modernization of existing machinery. The transmission provides variable speeds



from 0-1,600 rpm. for high torque, heavy duty applications such as pumps, winches, mixers, conveyors, elevators, and compressors.

The transmission can be driven at 1,800 rpm. or less with any 2-10-h.p. electric motor or 20-h.p. gas engine. Precise speed selection is obtained by rotation of hand wheel, which the makers say gives an infinite number of speeds through the entire range of the unit.

The transmission is equipped with roller and ball bearings throughout. It is described as being compact and light weight. For full information on the variable speed transmission, check No. 9351 on the coupon and mail.

No. 9356—Face Shield and Safety Hat

General Scientific Co. has developed a new face shield to protect eyes, face and under chin area. The shield is designed to be worn with safety helmet, and is said to be useful in industry where full face cover-

age is required against the possibility of spraying acids, foreign particles or other fragments. The shield is said to be light weight and comfortable and affords unrestricted vision and audibility. The gear fits all safety helmets and is made strongly enough for impact resistance, the makers state.

Complete information is available by checking No. 9356 on the coupon and mailing.

No. 9353—Polyethylene Sealing Method

Raymond Bag Corp. has announced what it calls a practical combination of the features of an independent polyethylene tube and a multiwall paper shipping sack. The new bag, designated MPS, combines a complete seamless polyethylene tube as part of the multiwall, sewn and heat sealed above the sew-line to give a perfect seal. The result, according to its makers, is the protection of polyethylene with the strength of multiwall. The makers claim that the polyethylene liner cannot pull out nor slip, and provides a production line package that can be filled on existing equipment. The bag has been used

successfully for ammonium nitrate and is suitable for other chemical fertilizer products, Raymond claims. For full details on the new combination bag, check No. 9353 on the coupon and mail.

No. 9354—New Hand Truck

Southeastern Manufacturing, Inc. has recently introduced a new hand truck featuring "roller conveyor action," which the makers say allows the load to be loaded and unloaded more easily. Closer stacking is

claimed, since the objects being loaded do not have to be shoved by hand after unloading. The truck is said to be built of electrically welded steel tubing and equipped with rubber tires and ball bearing wheels. Full details on the hand truck are available by checking No. 9354 on the coupon and mailing.

No. 9357—Portable Belt Conveyor

Finco, Inc. has introduced a new portable belt conveyor with a hydraulically powered raising frame. The hydraulic lifting action, with a total stroke of 17½ feet, is operated by one man and permits rapid height

adjustment, according to the makers. The new conveyor features a standard 18" wide belt with a self troughing action. Available in 20'-50' length frames in 5' increments, the unit has a capacity of 50 tons an hour at a belt speed of 150 ft. per minute, carrying any commodity with a density of 100 lb. per cubic foot. For full description of the belt conveyor, check No. 9357 and mail.

1960 Expansion Program Reported by Bemis Bag

ST. LOUIS, MO.—Bemis Bro. Bag Co. spent more than $2,750,000 on its plant expansion and modernization program during the year 1960, according to the company's annual report to stockholders.

The company's sales were $131,651,312, just slightly higher than a year ago, and earnings per share of common stock were $4.03 as compared with $4.24 per share in 1959. Both earnings per share and net income of $2,869,328 in 1960 were the second highest in the past decade.

Expenditures during the year on property, plant, and equipment were made both to expand output and to further manufacturing efficiency and cost reduction. The emphasis was on installing high-speed paper bag equipment, new printing presses, and modifications to existing equipment, the report stated.

Spencer Produces New 30-10-0 Fertilizer

KANSAS CITY, MO.—Spencer Chemical Co. has announced the production of limited quantities of a new type of commercial fertilizer, 30-10-0. In making the announcement, Byron Kern, vice president of the company's agricultural and industrial chemicals divisions, said that the material has been produced by a new Spencer-developed process at the Jayhawk Works, near Pittsburg, Kansas, for use in introductory marketing in spring of 1961.

Mr. Kern said that this addition to the company's fertilizer product lines follows a study which indicated that 30-10-0 would be a practical material both for direct application and as a component of complete mixed fertilizers made by conventional methods or by bulk blending.

He said that limited first-season sales of 30-10-0 will probably be mainly for mixing with other materials, such as 2-1-1 ratios. He added, however, that 30-10-0, which combines certain features of ammonium nitrate and ammonium phosphate, has potential value as a direct application material.

New Chemico Address

NEW YORK—Chemical Construction Corp. recently moved to 320 Park Avenue from its former address on West 43rd St.

The firm will occupy the second, third and fourth floors of the new 33-story Uris Brothers building, a total of more than 90,000 sq. ft. Chemico is a wholly-owned subsidiary of Electric Bond & Share Co. The new offices will serve as international headquarters for the executive, engineering and sales staffs of the company.

Arcadian® News

Volume 6 Nitrogen Division, Allied Chemical Corporation Number 4

How to Reduce Fumes and Dust in Dryer Operation

DON'T LET PROFITS GO UP YOUR STACK!

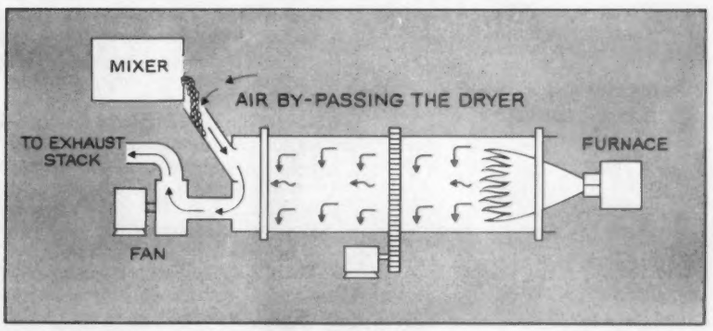
Are you losing money in dust and fumes from your dryer? Even when you receive no compaints about air pollution, clouds of dust, smoke and fumes emanating from your fertilizer plant are cause for concern. They can mean that plant foods which should be going into your fertilizer are going up your stack.

Dust and fumes usually mean that your dryer is not functioning properly. Here are four ways to improve the efficiency of your dryer—

1 Control the Flow of the Drying Air

In many counter-current systems the sticky mass of fertilizer is fed from the mixer to the dryer through a chute and openings that are oversized deliberately to prevent a choked-up condition. The result is that the dryer fan usually pulls more of its air from the plant atmosphere than it does from inside the dryer. In extreme cases, so little air is pulled through the dryer that smoke from the furnace (which, incidentally, should not be smoking) backs up into the plant, adding to poor working conditions.

In co-current dryers there is little excuse for these air problems, for it is a simple matter to discharge the dry, granulated material without permitting much air to leak through the discharge point.



Excessive volume of air by-passing the dryer presents a barrier to heated air (red arrows) in the dryer. As a result, very little heated air is drawn through the length of the dryer.

In an attempt to approach a satisfactory level of drying under these conditions, many operators merely increase the total flow of air through the fan in the hope that a little of it will pass through the dryer. Unfortunately, increasing the flow of air much beyond the volume for which a system's dust collector is designed all too frequently results in most of the dust being forced through the collector into the plant atmosphere.

The best answer to inadequate air flow through the dryer is obvious: keep the feed chute as full of mix as possible to exclude air, and add some constriction at the feed opening. Once you have reduced by-pass air to a minimum, you will notice a very definite improvement in dryer operation. In fact, any effort at all made in that direction will be well worth the trouble.

2 Regulate the Furnace

To offset the lack of drying air, some operators make the mistake of increasing the intensity of the heat from the furnace. This only makes a bad situation worse, for a condition of extreme heat near the

furnace combined with too little air through the dryer often causes breakdown of some of the materials, with resulting air pollution and loss of plant food. What's more, this combination of little air and excessive heat is even more destructive to good granulation at the higher rates of production. Operators should be careful not to judge the performance of a furnace by the amount of fuel being consumed. Some oil burners have been observed to project raw oil as far as 15 feet into the dryer before a flame occurs. Obviously, the heat from that flame has little effect on the 15 feet of mix behind it. It is imperative to keep burners in good operating condition.

3 Keep the Dryer Clean

As the flights in a dryer become fouled, at least two important changes are taking place: 1) Less and less of the material is being exposed directly to the drying air. 2) The product tends to roll more and more, which may cause excessive balling or large granules, and, of course, insufficient drying. Most operators already know that every condition in granulation must be maintained at a uniform level for best performance. However, it bears repeating that the dryer should be kept free of all build-up from damp or excessively heated materials.

4 Maintain Uniform Feed through the Dryer

In batch operations it is difficult to maintain uniform feed into the dryer, but much has been done in this area to improve general performance.

Accomplishing uniform feed in continuous systems is more easily done. However, too many operators assume that a dryer is being fed uniformly because the rate of material makeup is being accomplished at a measured pace. They overlook the fact that the recycle may be very irregular. Accordingly, every effort should be made to smooth out the flow of recycle into the process. If this is impractical, a constant vigil should be kept on performance so that adjustments may be made quickly to compensate for any irregularities.

Make these Checks, too

In addition to the four points treated above, there are several other areas that deserve careful scrutiny by the operator plagued by fumes and dust problems. For example, where sulphuric acid is used with batch operations in granulation, semi-granulation, or merely to obtain additional heat, some control over fumes and other losses can be effected by adding the potassium chloride after the acid has been neutralized in the ammoniation phase.

Ammonia fumes may well be caused by badly corroded or plugged distributor pipes—or a pipe system that may never have been designed properly in the first place. Since a properly operating distribution system is essential to good operations in general as well as to the control of fumes, operators would be well-advised to check this area periodically.

Where the venting of nitrogen solution measuring tanks at each charge creates an objectionable fume problem, it may be possible to operate through the existing measuring tank without this frequent venting. This can sometimes be done by merely increasing the pressure—within safe limits. Where pressure cannot be increased high enough with safety, a larger measuring tank will be required. Of course, the use of a meter in the flow line would eliminate any consideration of a measuring tank, while automatically solving the venting problem.

There have been instances where ammonia fumes have resulted from unrealistic ammoniation rates. For example, a formula may have been changed to derive more of the P_2O_5 from triple superphosphate. Where the original formula called for a substantial amount of normal superphosphate to be ammoniated at its maximum practical rate, the new formula should be adjusted for the lower ammonia take-up of triple superphosphate.

It Pays to be Cautious

There is no doubt that a great deal of the fumes, smoke and other losses in fertilizer plants result from overloading the equipment. This is bad enough when it is accidental, but is even worse when it is the result of a forced effort to increase production without first making a careful study of all the factors involved. Manufacturing mixed fertilizer has become a truly complicated operation; the easy way is not necessarily wrong, but it would be wise to check thoroughly before you change from a tried and true procedure. *If you need special help on any dust or fume control problem, we will be happy to assist you. This service is available to customers without charge. Just contact Technical Service, Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N.Y. Phone: HAnover 2-7300.*

How much is *ENUF* fertilizer?

Every farmer knows that you have to set a dozen eggs if you want to hatch a dozen chicks. But, many farmers do not seem to realize that you must have definite amounts of nitrogen, phosphate and potash in your soil, if you want to produce 100 bushels of corn per acre.

The example of the eggs and the chicks is a good, down-to-earth, easy-to-understand argument to use in selling fertilizer. It helps to convince the farmer that he should use *enuf* fertilizer per acre to produce the yields he wants.

Every Field a Test Plot

But a better way to demonstrate the value of fertilizer is to persuade farmers to run their own simple fertilizer tests. It's easy to make every field a demonstration plot.

Suggest to the farmer that he use no fertilizer on one strip across his field. This makes a check strip. Then tell him to double the usual fertilizer application on the next strip. Then use his normal application on the rest of the field.

Time spent in getting farmers to run these simple tests will pay off in extra sales. Many farmers, even when they follow state recommendations, are not using *enuf* fertilizer for maximum yields and profits. A strip with double the usual fertilizer application is often one of your best sales tools!

FAST TURN-AROUND OF TANK CARS HELPS YOU

In addition to producing the most complete line of nitrogen solutions, Nitrogen Division, Allied Chemical Corporation, operates the largest fleet of tank cars in the industry. All of our facilities and operations have been geared to rapid delivery of ARCADIAN® Nitrogen Solutions to help you meet production schedules. The goal is *on-time* shipment every day.

The ARCADIAN tank car fleet is large enough to handle just about every situation. However, if too many fertilizer manufacturers hold too many tank cars too long, the entire schedule is disrupted. A tank car sitting idle on your siding—or anyone else's—can't also be back at the Nitrogen Division plant, taking on the rush order you just placed.

Everyone benefits when there is fast turn-around of tank cars at both ends of the track. Nitrogen Division, as producer, can coordinate production and shipment better; while you, as consumer, can handle your peak demands more efficiently. A tank car shortage hits mixed fertilizer producers hardest. That's why you should resolve to return tank cars as fast as possible.

It pays to push production a little beyond normal pace or hours, in order to empty a car for the next railroad pick-up. Keep the cars rolling so that you will never run short of nitrogen.

SELL TONNAGE FOR TOP-DRESSING NOW

Top-dressing time is just ahead. When your rush season for mixed fertilizers is over, it will pay you to concentrate on aggressively selling ARCADIAN nitrogen materials (liquid and dry) for top-dressing and side-dressing. You can extend your season and sell more tonnage.

The market is there! Thousands of farmers in your sales territory will buy nitrogen for supplemental application this spring and summer. It will pay you to make sure that your mixed fertilizer customers buy their straight nitrogen from you. You can't help but benefit when your customers make you their headquarters for all their fertilizer needs.

You strengthen customer loyalty and you get a bigger share of the fertilizer market, when you supply all of the mixed goods analyses and straight materials your customers need and want. It pays to establish your prestige and your leadership as a dependable, one-stop, full-line source of supply.

Here are some of the benefits you get when you sell ARCADIAN nitrogen: 1) You increase your total sales and profits. 2) You help farmers to get better yields and insure that response to your mixed fertilizers will not be limited by lack of nitrogen. 3) You spread your overhead expense over a larger tonnage. 4) You keep your sales staff busy over a longer period. 5) You build farmers into exclusive customers for you and your dealers.

Nitrogen Division, Allied Chemical, manufactures and sells nitrogen for use in making mixed fertilizers and for direct application. Nitrogen Division has always fostered the role of nitrogen in a balanced fertilizer program and has spent millions of dollars to promote the use of mixed fertilizers. Nitrogen Division has also established ARCADIAN Nitrogen Products as the leading source of supplementary nitrogen for direct application.

It will pay you to let Nitrogen Division work with you in helping you to offer your customers a complete line of mixed fertilizers and straight nitrogen materials. Many different ARCADIAN Nitrogen Solutions are available for the manufacture of every mixed fertilizer analysis now in demand. Many different ARCADIAN Nitrogen Products are also available to sell to farmers for direct application.

These products are powerfully promoted with the biggest nitrogen advertising campaign in history. It will pay you to cash in on this campaign now! Extend your season and handle more tonnage, by selling ARCADIAN Nitrogen Products!

Don't miss this one!

"PLANT CORN SOLID" is the title of an article which appears in the February issue of FARM JOURNAL. It reports the success of a new idea: Plant corn in a solid stand with a grain drill—about 300,000 stalks per acre—then harvest it 50 to 60 days later for green feed or silage. Such a practice requires enormous quantities of fertilizer.

We suggest that you read this article. If you do not have the magazine, we will be happy to send you a reprint. Simply request this from Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

Arcadian

DRY NITROGEN PRODUCTS FOR DIRECT APPLICATION

AMMONIUM NITRATE
Pelleted Nitrogen Fertilizer

UREA 45 Nitrogen Fertilizer
Pelleted Urea Nitrogen

A-N-L® Nitrogen Fertilizer
Nitrogen with Magnesium

AMERICAN NITRATE of SODA
Nitrate Nitrogen and Sodium

Arcadian

LIQUID NITROGEN PRODUCTS FOR DIRECT APPLICATION

Golden URAN® Nitrogen Solution
Urea, Ammonium and Nitrate Nitrogen

FERAN® Nitrogen Solution
Ammonium and Nitrate Nitrogen

NITRANA® Nitrogen Solution
Nitrate and Ammonia Nitrogen

Anhydrous Ammonia
Concentrated Ammonia Nitrogen

Arcadian® NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60° F	Approx. Vap. Press. at 104° F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
DURANA®									
DURANA contains 8% formaldehyde.	37.0	13.3	53.4	15.9	9.4	7.2	1.235	0	36
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
[illegible]	82.2	99.9	—	—	—	24.3	0.618	211	-108

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

NITROGEN DIVISION

MAIN OFFICE: 40 RECTOR ST., NEW YORK 6, N. Y., PHONE HANOVER 2-7300

Allied Chemical

Hopewell, Va., P. O. Drawer 131.....Glenview 8-6301
Ironton, Ohio, P. O. Box 98.....Drexel 7-4366
Omaha 7, Neb., P. O. Box 166.....29 1-1464
Raleigh, N. C., 606 Capital Club Bldg.....Temple 3-2801
Columbia 1, S. C., 1203 Gervais St.....Alpine 3-6676
Atlanta 3, Ga., 127 Peachtree St., N. E...Jackson 2-7805
Memphis 9, Tenn., 1929-B South 3rd St. Whitehall 8-2692
Indianapolis 20, Ind., 6060 College Ave. Clifford 5-5443
San Francisco 4, Cal., 235 Montgomery St..Yukon 2-6840

Arkansas Fertilizer Firm Rebuilds Plant Destroyed by Fire Last Year

PINE BLUFF, ARK. — Planters Fertilizer & Soybean Co., Pine Bluff, was back in production well in advance of the 1961 season despite a fire which almost completely destroyed its manufacturing and storage facilities in April, 1960. The blaze destroyed the building housing the company's bulk storage and most of its granulation facilities. The fire was of course a major setback for the Pine Bluff firm, particularly when it occurred during the busiest portion of the season last year.

A completely new storage building, over 300 feet in length and about 150 feet in width, has been completed with the exception of the customer loading docks which are expected to be completed within a short time. New granulation facilities have been completed and are in operation, and inventories of mixed fertilizer are being built up as rapidly as possible.

Additional loading facilities and a second bagging unit are almost completed, and will be prior to the beginning of the spring season.

Planters Fertilizer & Soybean Co. has not only completed the new buildings, but also has added new granulation equipment. This new equipment includes new Tyler-Hummer vibrating screens, and an Omega feeder. The plant also has separate coolers and dryers, and a TVA ammoniator, cluster weigh hopper, and two new Kraft automatic bagging units.

The owners state that the new building will accommodate from three to five trucks for loading simultaneously. Finished goods stored in bags will be on pallets to expedite loading with the aid of a fork-lift truck. Bags taken from the pallets will be placed on conveyor belts for transportation to the truck. There are four loading conveyor belts in the new plant.

Facilities for loading and handling of bulk fertilizers are also included in the new building.

The structure itself is of steel construction, replacing completely the former building damaged during the fire of a year ago. Over-all bulk storage area is 230 x 120 ft., and a new hopper car unloader has been installed.

Dr. Paul Tally has recently been added to the staff of the company as an agricultural chemical consultant. Dr. Tally's consultant service will be for dealer and farmer customers.

Planters Fertilizer & Soybean Co. also is a distributor of anhydrous ammonia. A third transport truck for transporting anhydrous ammonia has been added to the various field service stations throughout the state.

Planters is operated as an all-Arkansas company by four Dunklin brothers, George, Lewis, Jim and Bill. Each of the brothers takes an active part in the over-all operation of the company's manufacturing and service facilities, as well as sales. Besides the new manufacturing features, a new heavy duty bag has been designed for their mixed goods fertilizer. The bag is ready, and besides 100 lb. and 80 lb. bags Planters will offer a 50 lb. bag size in 1961.

Simplot Buys Montana Fertilizer Facility

POCATELLO, IDAHO—J. R. Simplot, president of the J. R. Simplot Co., announced recently his firm's purchase of a fertilizer plant in Anaconda, Mont., from The Anaconda Co., and will move it to Pocatello by rail and truck, beginning June 1.

The purchase is part of a multi-million-dollar expansion program aimed at producing new items at the Simplot operation west of Pocatello.

The official declined to say what the exact cost of the expansion would be, but he did add it will be the "biggest phosphate producer this side of Florida," it was reported.

The new plant will produce ammonium phosphate, he stated. The present facility now produces phosphoric acid and triple super phosphate.

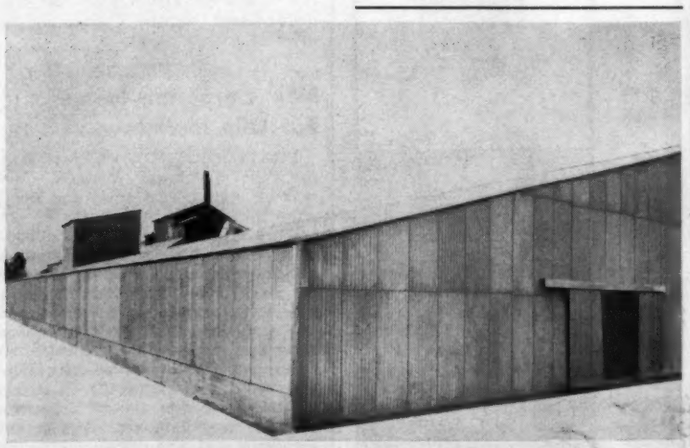
Mr. Simplot said the company doubled its capacity in the fall of 1959 with a $2 million expansion and this year's expansion will boost it another 60 to 100%. Some 70 new jobs will be created. The company now employs 225 people here.

Sale of the plant was announced last year by the Montana firm. Anaconda has been operating the facility for Simplot since that time and will continue to do so until the move is completed. Also previously announced was lease of phosphate properties at Conda, Idaho, to Simplot by Anaconda.

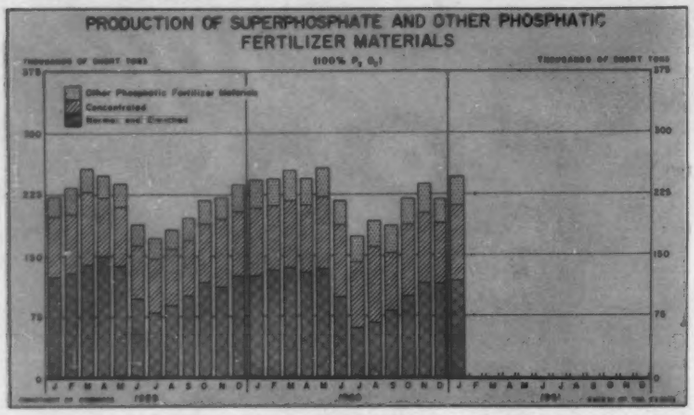
New Bemis Bag Plant Planned for Houston

ST. LOUIS, MO. — Construction plans for a new 200,000-square-foot plant at Houston, Texas, have been announced by Bemis Bro. Bag Co. The plant will manufacture paper, textile and open-mesh bags.

The new one-story facility will occupy an 18-acre site in northwest Houston. Ground will be broken in late spring, with completion anticipated for late fall and full operation scheduled by the end of the year. Cost will approximate $1.4 million, not including machinery and other contents, according to Judson Bemis, company president.



REBUILT AFTER FIRE—Planters Fertilizer & Soybean Co., Pine Bluff, Ark. has new and modern fertilizer production and storage facilities in operation less than a year after fire in April, 1960, almost completely destroyed former facilities. Above is new steel building with storage area 230 x 120 ft. Bags of finished goods are stored on pallets. Manufacturing facilities include TVA ammoniator, separate cooler and dryer.



PHOSPHATE PRODUCTION UP—Production of superphosphate and other phosphatic fertilizer materials was up slightly in January, 1961, as compared to the same month of 1960. The tonnage was 244,503 for January, 1961 against 241,784 tons that month in the previous year, according to figures just released by the Bureau of the Census, U.S. Department of Commerce. Shipments of superphosphate and other phosphatic fertilizer materials during the month totaled 172,772 short tons, or 6% above the volume shipped during the corresponding month of 1960. Stocks held by producing plants as of Jan. 31, 1961, totaled 442,555 tons, or 2% more than those held on Dec. 31, 1960. The above table shows production of superphosphate and other phosphatic fertilizer materials for the entire years of 1959 and 1960, and for January, 1961.

1960 Safety Efforts by Chemical Industry Result in Decrease of Accident Frequency

WASHINGTON — Intensified efforts by chemical manufacturers to improve on-the-job safety practices resulted in a decrease in the frequency rate of industrial injuries in 1960 as compared to 1959, according to a recent report by the Manufacturing Chemists' Assn.

The report stated that the frequency rate of injuries due to in-plant accidents declined from 3.38 per million man hours worked in 1959 to 3.19 per million man hours worked in 1960.

"This decline reflects a halt in the increase in the injury frequency rate which was evident in 1959," General John E. Hull, president of the MCA, stated in releasing the report. The 1960 frequency rate was below that of 1959, but was still higher than the rates of the three previous years—1956-7-8. (The rates for those years were 3.00, 3.01 and 2.98, respectively.)

The rate reported by MCA compares favorably with that announced by the National Safety Council for all manufacturing concerns. Despite the injury frequency rate increase to 3.38 reported by MCA in 1959 for the chemical industry, it is still below that reported by the council of 6.47 injuries per million man hours worked for that year for all manufacturing.

There were 112 chemical manufacturing companies participating in 1960 in the assn.'s analysis of worker injury experience. These companies range in size from those employing less than 250 workers to companies employing more than 5,000 persons. Of those 112 companies, 30 also participated in an analysis of off-the-job injuries which in 1960 increased to 6.35 from 5.68 million man hours of exposure in 1959.

Coincidentally, the on-the-job injury frequency rate for workers in those same 30 companies was 1.84 per million man hours worked.

The injury frequency rate last year was less than half the rate in 1946, the first year the association began making its analysis. In 1946, there were only 72 participating chemical firms, as compared to 112 at the present time.

In terms of severity rate of all injuries as measured in terms of calendar days lost per million man hours of exposure, the industry also showed a decline from 617 in 1957 to 552 in 1960, the report states.

Freeport Inaugurates Two New Mines, Writes Off Cuban Investment

NEW YORK—The opening of two new mines—Grand Isle in the Gulf of Mexico, first offshore sulfur operation in history, and Lake Pelto in Louisiana—and the inauguration of a liquid sulfur distribution system were reported at a recent meeting of stockholders of Freeport Sulphur Co. by Langbourne M. Williams, chairman, and Charles A. Wright, president.

In 1960, the report said, the company's tonnage sales of sulfur increased to about 2,200,000 tons as consumption — particularly overseas consumption — reached a new high. Revenue per ton was off, however, resulting in slightly lower gross sales despite the tonnage increase. Production of sulfur approximated sales, the annual report stated.

The company also told stockholders that it had written off its investment in its Cuban nickel-cobalt project "because of the conditions in Cuba and the large amount of debt." Freeport Sulphur's investment in and advances to its subsidiary, Freeport Nickel Co., were written down to a nominal value of $1 by a charge of $18,030,000 to earnings retained in the business. The Cuban facilities were seized by the Cuban government in August, 1960.

New Corporate Image For Olin Mathieson

BALTIMORE, MD.—A "new look" for Olin Mathieson Chemical Corp. will be seen hereafter in the firm's advertising and other printed literature, the company has announced. The word "Olin" will now be used as uniform nomenclature for the company's identity. This move will be reflected immediately in all corporate and divisional communications, according to Henry H. Hunter, director of communications for Olin. The program is expected to reduce possible confusion caused by an excess of brand names, trademarks, logotypes and signatures.

The familiar "bird" used as a trademark on the company's ammophos product and other chemical items will give way to "Olin Chemicals Division" treatment, Mr. Hunter said.

FORMULATION

Continued from page 6

active carriers can be used as diluents without deactivation. Often, nonactive carriers are not used alone but are combined with active carriers in order to obtain satisfactory bulk density and flowability. In such cases, sufficient urea (for aldrin or dieldrin) or HMT (for endrin) must be added to neutralize the catalytically-active portion of the diluent; this is necessary even though the concentrate used has been deactivated with urea or HMT.

If a combination of carriers is used, the amount of urea or HMT required is based on the percentage of urea or HMT required for deactivation of each component and the amount of that component in the formulation. The deactivators are added as preground mixtures with the active carriers which usually contain 25% urea or HMT.

Since field-strength dusts are not normally ground, extra care in blending must be taken to insure complete deactivation. This is achieved by charging the ribbon blender with the preground urea or HMT concentrate, the insecticide dust concentrate, and one third of the diluent and thoroughly blending the mixture. Then the remainder of the diluent is charged to the blender for final blending.

Costs can be kept to a minimum in the manufacture of field strength aldrin, dieldrin, and endrin dusts by careful selection of diluent materials. Unless combined with other pesticides which are liquid or low-melting, the sorptive capacity of the diluent is not a critical factor.

As is the case with emulsible concentrates, the demand for endrin-methyl parathion mixtures on dusts for use on cotton is also growing. HMT which is normally used to deactivate catalytically-active carriers for endrin is incompatible with methyl parathion. The carriers normally used in preparing methyl parathion dust concentrates catalytically decompose endrin. The best solution for circumventing the problem is to use certain talcs which can be deactivated against endrin decomposition with 1% urea. At this urea concentration, the stability of the methyl parathion is unaffected.

A suggested manufacturing procedure for such mixtures is 1) prepare a 25% endrin dust concentrate on talc deactivated with 1% urea; 2) blend-down to the appropriate endrin concentration with the same urea-deactivated talc; 3) impregnate with liquid Technical Methyl Parathion using a nozzle capacity that maintains a dry or semi-dry mixture in the blender; 4) after-blend to insure uniformity; and 5) pass the mixture through a coarse attrition mill to break up any agglomerates.

Dusts containing mixtures of endrin and methyl parathion should be made only in equipment suitable for handling methyl parathion or other organophosphorus insecticides, being sure to take the extra precautionary measures recommended for working with highly toxic organophosphorus materials.

Aldrin, dieldrin, and endrin granules are made by first spraying the appropriate amount of aqueous 50% urea (for aldrin and dieldrin) and 40% HMT (for endrin) solutions onto the tumbling granular carrier, and then impregnating the granules with a solution of the insecticide. The preferred type of mixer is the tumbling type. When ribbon mixers are used, their speed must be adjusted and clearance between the blades and the body of the blender set so as to minimize attrition and the consequent formation of fines.

The insecticide concentration of the impregnating solution is determined by the following factors: 1) the solubility of the insecticide in the solvent, 2) the insecticide concentration of the finished product, and 3) the volume of solution required to insure uniform coverage of the granules without exceeding their sorptive capacity. Generally, a minimum of one gallon of insecticide solution per 100 lb. of granules has been found to give satisfactory, uniform coverage with the high-sorptive carriers.

Low vapor pressure solvents, such as diesel oil, are preferred for the impregnation of granules for application to corn and other types of foliage, because of their nonphytotoxicity to the corn plant. For such applications, it is also important to keep the total solvent close to the minimum required for uniform granule coverage. In preparing granules for soil application or in area insect control, high aromatics content solvents, such as heavy aromatic naphtha, may be used because phytotoxicity considerations generally are not critical. As is shown in Table I, the solubility of aldrin, dieldrin, and endrin in either type of solvent is more than adequate to permit the formulation of all the commonly recommended granule concentrations.

A common way to apply aldrin to the soil is in a mixture with solid fertilizers. Aldrin-fertilizer mixtures are prepared by impregnating a tumbling bed of cured fertilizer with aldrin solution or else blending, in a rotary or comparable mixer, a mixture of aldrin granules and fertilizer. High-flashing solutions containing 4 lb. aldrin per gallon and 25% aldrin granules, usually 15/30 mesh, are commercially available as the aldrin source. Forty-percent aldrin granules (on vermiculite) are also available in certain areas.

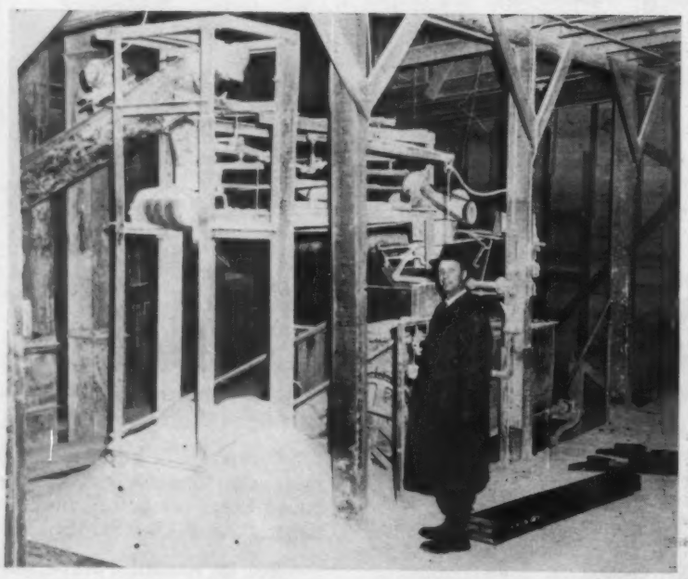
The availability of these highly concentrated aldrin formulations allows the fertilizer manufacturer to prepare aldrin-fertilizer mixtures without materially affecting the nutrient statement on the label. Since aldrin is chemically compatible with most fertilizers, mixtures with long shelf-life can be expected.

Dieldrin-fertilizer mixtures are prepared in a similar manner. The dieldrin source is usually 10 to 15% dieldrin granules or high-flashing solutions containing about two pounds of dieldrin per gallon. Like the aldrin mixtures, they are stable in long-term storage.

A comprehensive treatment of the formulation of aldrin, dieldrin, and endrin is beyond the scope of this article. The manufacturers of these insecticides have available literature giving detailed compositions of formulations which have been developed in their own laboratories. Equally important, they have available safe handling and first aid information with which every formulator handling these insecticides should be familiar.

☆ ☆ ☆

☆ ☆ ☆



SUPERPHOSPHATE FACILITIES—Gilchrist Plant Food Co., Morris, Ill., recently went on stream with a continuous manufacturing process producing superphosphate, described by D. R. Gilchrist, owner, as being "very dry and friable superphosphate." Production planned on an annual basis, Mr. Gilchrist says, will be more than 25,000 tons. The plant operates at the rate of from 17-22 tons an hour. At the present, rock phosphate is received by rail and sulfuric acid by truck. It is possible that rock may be brought in by barge at some future time, due to the proximity of the Illinois River. In the photos above are an aerial view of the plant acreage and building when still under construction; interior view of superphosphate storage; and at the bottom, Mr. Gilchrist at one of the measuring stations in the plant. The facility produces run-of-pile, granular, and semi-granular superphosphate. Storage building is 330' x 160'.

Fertilizer Makers, Salesmen, Hear Talks on Soil Needs at Conference

UNIVERSITY PARK, PA.—It was "full house" for the annual fertilizer and lime conference held recently at the Pennsylvania State University. Two hundred lime and fertilizer manufacturers and salesmen attended—in addition to scientists from Penn State's College of Agriculture and other universities.

Fertilizer won't do the job it should if soil structure is poor, declared Louis T. Kardos, researcher in soil technology for the Pennsylvania Agricultural Experiment Station.

Dr. Kardos said soil erosion data support the idea that adequate lime and fertilizer are keys to good soil structure.

Pennsylvania farmers, generally, should step up their use of high grade limestone to correct critical soil acidity, claimed James H. Eakin, Jr., extension agronomist at Penn State. He estimated that 75,000 tons of limestone are needed each year to offset soil acidity.

Delegates were urged to help make available to farmers the technical information that will enable the fertilizer user to cope with changing trends in agriculture. Herbert R. Albrecht, director of the agricultural extension service at Penn State, said the trend to fewer but larger farms makes farmers more dependent upon the latest scientific information.

John L. Ragland, researcher in soil technology, claimed an improved procedure is needed for determining the lime requirements of extremely acid soils. Present procedures do not predict accurately the lime needs of extremely acid soils, he pointed out.

Thomas R. Cox of the American Cyanamid Co. explained that organic matter and crop residues improve greatly the efficiency of fertilizers. He called organic matter the "fuel for bacterial fires in the soil, which operate as a factory producing plant nutrients."

"Organic matter can be compared to a thermostat on a furnace or a shock absorber on a car," Mr. Cox affirmed. "The organic matter is burned to carbon dioxide, mineral salts, ammonia, and other residues. The plant food produced is gradually released for use by the crop."

Mr. Cox mentioned 20-year experiments at Penn State showing that organic matter is a key factor in recovery of phosphorus. Soils high in fresh organic matter generally have more readily available phosphorus than soils lacking in organic matter.

One-fourth of the 141 soil samples tested at Penn State for magnesium levels were deficient in 1960, Ernest L. Bergman, researcher in plant nutrition, told the group. Soil samples for magnesium testing came from 25 counties in the state, he reported.

Dr. Bergman added that calcium levels were very low in 12% of the soil samples sent in from 20 counties.

Boron applications might be needed on several Pennsylvania soils for optimum growth of apples, alfalfa, clover, and certain vegetable crops. There should be no boron deficiencies in Pennsylvania soils for corn, small grains, grasses, or potatoes, according to Albert S. Hunter, soil technologist at Penn State.

Dr. Hunter claimed research is needed to determine boron needs of Pennsylvania soils. Over-liming and drouth, he said, are often found to limit the amount of boron available for crops.

"With modern soil testing, it is the crop we have to look at," said Francis A. Raymaley of American Cyanamid Co.

"It appears we must match fertilizer applications with individual crops," he asserted, "but at the same time keep the soil fertility levels high."

If a soil tests below medium in any nutrient, then some excess plant food for actual crop need should be applied, Mr. Raymaley recommended. If the test is medium or above in nutrients, then the crop should be fertilized, he added.

Fertilizer sales people should think in terms of providing service to the user, rather than fertilizer alone, declared Murry C. McJunkin of U.S. Steel Corp. Mr. McJunkin suggested that dealers should help their customers keep fertilizer records on each field—for four years or between soil tests.

He claimed plants, on the average, will recover 60% of the nitrogen used as fertilizer—depending on the season and the crop. Also, crops will recover 40% of the phosphorus applied and 60% of the potassium, Mr. McJunkin pointed out.

"Our biggest fertilizer market potential lies in bringing our present

PENNSYLVANIA SCENE—Officers and directors of the Pennsylvania Plant Food Educational Society for 1961, named during the recent annual Fertilizer and Lime Conference held at Pennsylvania State University. Seated, left to right, Robert F. Fletcher, University Park, Pa., vice president; William E. Angstadt, Reading, Pa., president; W. Wayne Hinish, University Park, Pa., past president. Standing, F. Edward Smith, Jr., Potash Company of America; Richard F. Resig, York, Pa.; Henry S. Klosky, Baltimore, Md.; F. Edward George, Thomasville, Pa.; James W. Bratt, New York; W. D. Wilson, Baltimore; and Basil M. Surgent, Baltimore.

customers up to the most efficient level of fertilizer use," he stressed.

W. Wayne Hinish, extension agronomist, described an intensive soil testing program carried out in Columbia County, Pa., during 1960. Enlisting the aid of lime and fertilizer companies, the county agent and staff increased the number of soil samples taken from 300 to 1,600.

Following the soil testing, fertilizer sales in this county increased $28,000 in one year, Mr. Hinish reported. The National Plant Food Institute, sponsor of the intensive soil testing program, reported a definite shift to higher analysis fertilizers than formerly used.

Mr. Hinish referred to the 1959 Census of Agriculture: The data shows a need for more fertilizer per acre and the "poor respect the farmer has for forage crops," he said. At least 80% of forage acres in Pennsylvania are getting no fertilizer, it was revealed.

Test farms in Pennsylvania show that good management pays. Results from six unit demonstration farms show a very rapid change in crop yields and net income as improved management practices were put to use.

Corn yields on the six unit demonstration farms jumped from an average of 45 to 95 bu. an acre, and hay yields from 2 to 3.2 tons, stated W. H. Garman of the National Plant Food Institute, Washington, D.C.

Income of these six farmers increased from $4,542 to $7,711 a year —about a 70% increase.

"This represents what can be done on almost any average Pennsylvania farm if the management skills are available or can be provided," Mr. Garman asserted.

Chemical Workers Fewer, California Report Says

SAN FRANCISCO — Employment in California's chemical industry declined slightly between December and January. However, production workers, at least in the agricultural chemical field, were working longer hours.

The state Department of Industrial Relations, Division of Labor Statistics, reports that 39,200 wage and salary workers were employed in the chemical and related products industry in January, 1961, compared with 39,600 in December, 1960. Total employed in the industry in January, 1960, was 38,900.

The work week in the agricultural chemical industry rose from 40 to 41 hours between December and January. The average weekly wage rose from $101 to $104, while average hourly earnings rose one cent to $2.54.

Big Gains Seen in Oregon Farm Size

SALEM, ORE—Oregon farms grew an average of 120 acres in size and went up 50% in value during the five years between the last two farm census periods, Oregon State University has reported.

The agriculture census of 1954 showed farms in the state averaging about 386 acres in size. By the 1959 census, this average had grown to 507 acres. This change in size resulted largely from combining existing farms rather than by bringing new land into agriculture production. Total amount of cropland in the state held steady at about 5.3 million acres, the report says. After correcting for the change in the census definition of a farm, it was found that the number of farms decreased by 5,315 during the five-year period, with around 43,000 farms now in the state.

During this same period, value of land and buildings per farm in Oregon jumped from an average of $27,789 in 1954 to $41,684 in 1959.

FAO Fertilizer Plan Gets Under Way On World-Wide Basis

WASHINGTON — The Food and Agriculture Organization (FAO) has announced that the first two-year phase of a program aimed at expanding and improving the use of fertilizers has become operational and that the fertilizer industry, which is financing the program, has contributed or pledged $262,300 towards the first year's work under the program.

A panel of fertilizer industry representatives last July asked FAO to undertake a five-year $2 million program as part of its "Freedom from Hunger" campaign. The panel agreed, on the basis of an action program by FAO, that the industry should contribute $350,000 in the first year and $450,000 in the second, and that further support would be given for the following three years if the program developed to the satisfaction of all concerned. It was also agreed that the program could become operational when three-quarters of the first year's contributions had been signified by the industry.

Dr. Frank W. Parker, assistant director-general and head of FAO's technical department, said that contributions to date have come from the Centre d'Etude de l'Azete, the Foundation for International Potash Research, the Institut International de la Potasse, the International Superphosphate Manufacturers in North America, the Shell International Chemical Co. and the Sulphur Institute. "This is the culmination," he said, "of a great deal of effort and planning on the part of both the industry and the organization.

"It is a prime example of the way in which industries working in the agricultural field can assist in ensuring the success of the 'Freedom from Hunger' campaign. There is a greater realization in the world that in many countries, in order to achieve targets for agricultural production, more fertilizers are needed. Nevertheless, in many countries little information and proof is yet available on their effective use. This program aims at providing these countries with the means of starting on the promotion of fertilizer use."

At last July's meeting the fertilizer industry panel and FAO agreed that the aim of the program was to stimulate the interest of governments and farmers of less-developed countries in the efficient use of fertilizers, and to provide governments with the advice and information necessary for developing national fertilizer programs. This would be achieved through a field program of fertilizer tests and demonstrations, and through developing soil-testing laboratories and services as a means of improving the use and management of fertilizers.

Dr. Parker said that FAO plans to start field programs of fertilizer trials and demonstrations along with soil testing in the Near Eastern, West African and North Latin American regions. One regional soil fertility specialist would be assigned to each region, along with two assistants. Within each region the program would be initiated in the countries which evinced the greatest interest in participating.

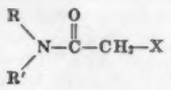
PRODUCTION PROCESS PATENTS

2,974,010

Preparation of Nitrogen-Phosphoric Acid Compounds. Patent issued March 7, 1961, to Alfred Koster, Dusseldorf Oberkassel, Germany, assignor to Henkel & Cie. G.m.b.H., Dusseldorf-Holthausen, Germany. Process for the production of nitrogen-phosphoric acid compounds which consists essentially of reacting anhydrous ammonia with a member selected from the group consisting of the anhydrous phosphate salt of ammonia and alkali metals, and mixtures thereof, said phosphate salt being selected from the group consisting of pyrophosphate, metaphosphate, trimetaphosphate, hexametaphosphate, tripolyphosphate and tetrapolyphosphate at a pressure of between about 30 to 120 atmospheres' gauge and at a temperature of between about 50 to 130 degrees C. and recovering the nitrogen-phosphoric acid compound formed.

2,973,258

Unsymmetrical Alpha - Haloacetamide Herbicides. Patent issued Feb. 28, 1961, to Philip C. Hamm, Webster Groves, and Angelo J. Speziale, Kirkwood, Mo., assignors to Monsanto Chemical Co., St. Louis, Mo. The method of inhibiting the germination of grass seeds in contact with soil and the preemergence growth thereof, which comprises treating the said soil with a herbicidal amount of the compound of the structure:



wherein R is an alkyl radical having seven (7) to fourteen (14) carbon atoms, R′ is an aliphatic radical having from one (1) to four (4) carbon atoms selected from the group consisting of alkyl, alkenyl, alkynyl and the corresponding halogen substituted radicals, and wherein X is a halogen atom selected from the group consisting of chlorine, bromine and iodine.

2,973,259

Methods for Killing Weeds and Woody Brush. Patent issued Feb. 28, 1961, to Max T. Hoebel, Chadds Ford, Pa., assignor to E. I. duPont de Nemours & Co., Wilmington, Del. A method for killing weeds which comprises applying to a locus to be protected in an amount sufficient to exert herbicidal action at least one trialkylamine-sulfur trioxide adduct of the formula $R_1R_2R_3N{\cdot}SO_3$ wherein R_1, R_2, and R_3 are alkyl groups of from 1 to 4 carbons inclusive.

2,974,030

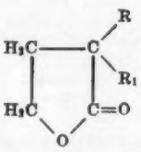
Insecticidal Plant Mulch. Patent issued March 7, 1961, to Robert J. Geary, Blue Point. N.Y., assignor to Plant Products Corp., Long Island City, N.Y. An insecticidal plant mulch composition in particulate form consisting essentially of, approximately by weight, 0.1 to 5% of a nuclearly polychlorinated organic contact insecticide, 0.05 to 5% of a systemically active insecticide, 80 to 99% of mulch materials, and 1 to 18% of a decatalyzer selected from the group consisting of urea and hexamethylenetetramine.

2,974,083

Insecticidal Compositions. Patent issued March 7, 1961, to Moshe Neeman, Buffalo, N.Y., assignor to Wisconsin Alumni Research Foundation, Madison, Wis. Insecticidal DDT compositions for destroying insects resistant against the action of DDT alone, containing by weight for each part of DDT, as a DDT potentiating agent, 0.025 to 10 parts of p-chlorobenzenesulfonic acid-N-di-(R)-amide, where R represents an n-alkyl group containing 2 to 7 carbon atoms.

2,974,084

Alpha-Halogenated-Gamma - Butyrolactones as Nematodes. Patent issued March 7, 1961, to Raymond L. Mayhew, Phillipsburg, N.J., and Earl P. Williams, Pen Argyl, Pa., assignors to General Aniline & Film Corp., New York. A method for controlling soil nematodes which comprises contacting said nematodes with a fumigating amount of an α-halogenated-γ-butyrolactone having the following general formula:



wherein R represents a member selected from the class consisting of hydrogen and chlorine, and R_1 represents a member from the class consisting of chlorine and bromine.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of $25 must accompany each notice of opposition.

Blast, in capital letters, for crabgrass killer. Filed April 1, 1960 by L. Teweles Seed Co., Milwaukee, Wis. First use Nov. 14, 1959.

Dry Dixsol, in capital letters, for nitrogen solutions used as or in the production of soil fertilizers. Filed Feb. 1, 1960, by Commercial Solvents Corp., New York. First use, Sept. 30, 1959.

Hg-16, hand-drawn letters, for insecticide for house and garden. Filed July 11, 1960, by Effective Products, Chicago, Ill. First use Feb. 24, 1960.

Picture of Man (Harry Smith), as trademark for herbicides and pesticides. Filed July 18, 1960, by Monsanto Chemical Co., St. Louis, Mo. First use March 29, 1960.

Pax Pride, in capital letters, for fertilizers. Filed March 18, 1960, by

Utah Cooperative Assn., doing business as Pax Company, Salt Lake City, Utah. First use Dec. 7, 1959; in November, 1937, as to "Pax."

Robertson's Old Reliable, in hand-drawn design, for tobacco fertilizer. Filed July 29, 1960, by Robertson Chemical Corp., Norfolk, Va. First use spring of 1929.

Dolmon, in capital letters, for natural and artificial fertilizers. Filed Aug. 22, 1960, by Norsk Hydro-Elektrisk Kvaelstofaktieselskab, Oslo, Norway.

Gro-Best, in capital letters, for concentrated plant food. Filed Aug. 29, 1960, by Hoff Chemical Corp., Flat Rock, Mich. First use May 24, 1960.

Geigy, in hand-drawn letters, for agricultural chemicals such as fungicides, insecticides, nematocides, herbicides, and industrial chemicals. Filed May 29, 1959 by Geigy Chemical Corp., Ardsley, N.Y. First use, April 8, 1959.

Myacide, in capital letters, for rodenticide: namely a rat and mouse bait in solid, grain or pellet form. Filed July 29, 1960, by Gray Realty Corp., doing business as Myzon Laboratories, Chicago, Ill. First use on or about July 12, 1960.

Grace, with word centered on drawing of flag, for urea for use as fertilizer. Filed Jan. 12, 1960, by W. R. Grace & Co., New York. First use, Jan. 30, 1959.

Lawn Life, in capital letters, for fertilizers. Filed May 4, 1960, by Unexcelled Chemical Corp., New York. First use on or about April 6, 1960.

Morgro, in hand-drawn letters on artistic rectangular background, for fertilizers. Filed July 29, 1960, by Wasatch Chemical Co., Salt Lake City, Utah. First use June 1, 1940.

Sensible Handling of Pesticides Can Reduce Hazards, Halt Complaints

By Dr. George C. Decker*
Principal Scientist and Head, Section of Economic Entomology, Illinois Natural History Survey, Urbana, Illinois

AMERICAN PEOPLE enjoy the most abundant and varied food supply of any nation in all history. It is obvious that any improvement, or even the preservation of this status, depends upon maintaining present efficient standards of food production and conservation.

Plant and animal pests rank among the foremost causes of food destruction. Thus, it is absolutely necessary to protect growing crops and products from such attacks. The average American takes for granted his standard of living, including a bountiful food supply. Thus, it is often difficult to present to these people the nature and magnitude of the activities of pests.

Cultivated crops grown in North America are attacked by over 3,000 species of insects, as many plant disease agents and uncounted numbers of nematodes, rodents, weeds and other competitors for crops.

Many factors have contributed to the increased prevalence and destructiveness of insects and other pests during the past century. Here are some of the factors:

1. As farmers used the same fields over and over, pests had less difficulty finding suitable host plants.

2. After several generations, certain pests which had not before attacked cultivated crops, developed such an appetite and became extremely destructive.

3. The breeding of crops for increased yields was in many instances accompanied by an increased susceptibility to one or more pests.

4. Many species of pests have been carried from one part of the country to other sections where they were not previously known. Also many have been brought in from abroad.

Obviously if all efforts to control pests were to be abandoned in this country, our agricultural lands would soon revert to the conditions that prevailed prior to the advent of the white men. Under those conditions the North American continent supported a human population of about 1,000,000. If we were to adopt a policy of "Let nature take its course," as some advocate, it is possible the experts would find disposing of some 200,000,000 surplus human beings even more perplexing than handling the wheat surplus.

In the beginning, farmers generally had to rely upon nature to control pests. But as losses mounted and demands for perfection rose from a discriminating consuming public, the farmers began to clamor for governmental aid in solving the pest problem. Early state and federal entomologists, botanists, and crop specialists were essentially naturalists. They preached a gospel of biological and cultural pest control methods for years, since no other course was open to them.

Diligent efforts were made and are still being made to control insects and diseases by good cultural practices, and while some astounding achievements have been attained through such research, the development of resistant varieties of plants has important practical limitations. The introduction of parasites, predators, and disease organisms has proved advantageous, but here again such practices have very definite limitations.

As the needs for better pest control grew and it became increasingly apparent "natural" measures alone were inadequate, the farmers themselves turned to the use of chemicals which showed promise. Scientists reluctantly were forced into the position of following their lead. Thus the age of chemical pest control was born.

The rise in pesticide usage has run parallel to advances in farm mechanization. Thus, along with automation and labor-saving devices, many farm managers now regard pesticides as chemical tools and think of them as helpful tools.

No one knows what would happen if the use of pesticides were to be prohibited or abandoned, but it is safe to say fruits and vegetables either would totally disappear from the market or the price of the meager quantities produced would soar to levels where they would be classed as luxuries available only to the rich.

Valid studies show that apples produced without pesticide protection will be 40 to 50% damaged by codling moth and 60 to 80% damaged by apple scab, plus an equal or even greater degree of damage to fruit caused by innumerable other insects and diseases. To this must be added the destruction by additional pests that result in the devitalization and eventual destruction of the trees themselves.

Without the benefit of pesticides, the yield of staple fiber, cereal, and forage crops could be expected to drop by from 10 to as much 25%. Two separate USDA studies over periods of 34 and 20 years showed that the omission of insecticide treatments reduced cotton yields 25.5 to 41.8%, respectively. The University of Illinois has demonstrated that a given acre of land is able to produce about so much dry matter in any given season. Therefore, whatever is wasted in weed production must be subtracted from the crop. With weeds partially uncontrolled, crop yields would certainly be reduced, but completely uncontrolled, yields would be nil.

There are those who say we should revert to the use of those partially effective control methods used before the advent of pesticides. That is impossible. Farming has risen to the status of Big Business. Modern agricultural practices demand maximum efficiency. Unlike conditions 20 to 30 years ago, capital investments on farms today are so large the growers can no longer afford occasional complete or even partial crop failures and still stay in business. The days of the hoe, hand picking of potato bugs, and the maintenance of furrow barriers for the control of chinch bugs and armyworms are gone forever.

When DDT and at least a dozen other new chemicals became available for general use, a number of competent and distinguished scientists expressed concern that widespread use of these materials might create a public health problem. Almost immediately, publicity seekers and misguided individuals seized upon the idea that the public was being poisoned, and an amazing flood of scare stories appeared. Later the witch hunt got underway in earnest.

Absurd charges and countercharges were hurled back and forth in congressional committees and in the press, the scientists settled down to a detailed analysis and factual study of the problem. The public health aspects of pesticide usage were reviewed by several scientific bodies, notably the World Health Organization, the U.S. Public Health Service, and the Food Protection Committee of the National Research Council. The general conclusions drawn in each instance were: (1) The large-scale usage of pesticides in the manner recommended by manufacturers or competent authorities and consistent with the rules and regulations promulgated under existing laws would not be inconsistent with sound public health programs, and (2) although the careless or unauthorized use of pesticidal chemicals might pose potential hazards requiring further consideration and study, there was no cause for alarm.

These encouraging conclusions notwithstanding, the fact that insecticides may be misused remains a matter of concern to a considerable segment of the American public. This is true particularly of certain groups of food faddists and conservationists. The latter quite correctly insist that

*From paper presented before American Dehydrators Assn., New Orleans, Feb. 10, 1961.

many forms of wildlife are subjected to certain potential hazards not shared by man and his domestic animals.

Before attempting to enumerate and evaluate the various hazards inherent in the use of insecticides, one must recognize and rather thoroughly understand a few more or less axiomatic principles. In the first place, we must recognize that practically all insecticides have toxic properties and are at least to some extent toxic to warm-blooded animals, including man.

The fact that most insecticides are toxic to man and animals does not necessarily mean that they cannot be used safely. If we develop a proper respect for the toxic properties of a substance it may frequently be used with greater safety than a much less toxic substance which is apt to be handled carelessly.

A careful distinction must be drawn between the terms "hazard" and "toxicity." As the Food Protection Committee of the National Research Council has repeatedly pointed out: "Toxicity is the capacity of a substance to produce injury; hazard is the probability that injury will result from the use of the substance in the quantity and in the manner proposed." To be at all reliable, an estimate of the hazard involved in the use of any substance must be based not only upon a knowledge of its inherent toxicity, but upon the details of its proposed use, as well.

If we are to avoid confusion we must also distinguish between use or operation hazards and residue or food hazards. In other words, the hazards associated with residues and food contamination may not be related to and should not be confused with the occupational hazards associated with manufacturing or application practices.

In general, use or occupational hazards are related to and may be measured in terms of the acute toxicity (response to a single exposure or dose) of the pesticide and the degree of exposure to it. Here we consider the possibility or probability that men engaged in the manufacture, processing, or application of a pesticide or pesticidal chemical will be injured or seriously affected by the substance, either through normal use or accidents and carelessness in handling the material.

Insecticide residue or food contamination hazards are, in general, closely related to and may be measured in terms of the chronic toxicity (response to continued or prolonged exposure to or intake of a substance) of the chemical and the amount of the residue appearing on or in the food as it reaches the consumer. The inherent toxicity of an insecticide or an insecticidal chemical to warm-blooded animals may have little or no direct bearing on the final food contamination hazards.

Very often the most toxic materials can be applied at a time or in a manner that would not endanger foods and, as a rule, such chemicals are applied in proportionately smaller amounts than are less toxic materials. Also some of the most toxic compounds are short-lived—in other words, they are quickly destroyed through chemical change or lost through evaporation.

Two existing federal laws are more than adequate to protect our food supply against undue loss in productivity and against any possibility of contamination to a point where it might become a hazard to the health of the consumer. These are the Federal Food, Drug and Cosmetic Act of 1938, as amended by the Miller Bill, and the Federal Insecticide, Fungicide and Rodenticide Act of 1947. Under provisions of these laws, manufacturers must spend approximately $1 million on research required to establish practical value and safety of a new product.

It is generally conceded that safety factors ranging from 10 to 100-fold have been included in the over-all evaluation of data on performance, residue persistence, and toxicity. At times such factors have been superimposed one upon another until the possibility that an actual hazard may exist is fantastically remote.

A great deal of time and money goes into the preparation of the labels placed on pesticide containers. The information given there represents the end result of the very extensive research carried on by the manufacturer; the recommendations have been carefully scrutinized for safety and effectiveness and approved by the appropriate government regulatory agencies; and since a large margin of safety is incorporated into recommendations and tolerance, it is safe to say that, when properly used, in full accord with label directions, pesticides present no threat to the safety of the consumer.

All of the foregoing notwithstanding, we still have a public relations problem. Large segments of the public are apprehensive and many individuals are waiting and ready to exploit any mistake we make. Therefore, it is important that every individual in any way associated with pesticide usage understand the basic facts about residues and their implications so that he can help avoid embarrassing incidents and counteract false propaganda.

PCA Superintendent Dies

BIG SPRING, TEXAS—Raymond R. Knill, Potash Company of America administrative assistant, died in a local hospital here recently. Mr. Knill had been with the company since 1946.

In 1956 he was awarded a 30-year Joseph A. Holmes Safety Award. Formerly he had held the positions of general superintendent and safety engineer at PCA. He had won the national safety title four times during his seven years as a safety engineer.

ENTOMOLOGISTS ELECT OFFICERS

JEKYLL ISLAND, GA.—Wayne W. Wells of Tifton, Ga., was elected president of the Georgia Entomological Society at the annual meeting on March 8-9 at Jekyll Island. He succeeds Orlin K. Fletcher, Jr., of Albany, Ga.

Mr. Wells is district sales manager of the Florida Agricultural Supply Co. of Jacksonville, Fla.

Elmer W. Beck, a research entomologist at the Coastal Plain Experiment Station in Tifton, was elected vice president. Mr. Wells was elevated from the vice presidency, a position he held in the society the past year. Mr. Beck had previously been on various committees in the organization.

QUESTIONS — ANSWERS

From You — From Experts

QUESTION—Our production problem is in loss, or shrinkage, of product. We find disparity of up to around 7% between the tonnage brought into the plant as raw materials, and what we ship out in form of finished goods. Some is lost in process, we think, but our shrinkage seems like too much. What can we do to stop it? Our plant manufactures both liquid mixes and granular dry products. —(Western operator, name withheld.)

ANSWER—(By Richard G. Powell, Mgr., Technical Service Dept., International Minerals & Chemical Corp., Skokie, Ill.) The questioner should not feel lonesome in his concern about fertilizer shrinkage in the plant. It is only relatively recently, however, that this problem has been recognized as a major factor affecting profit. In earlier days, when raw materials and manufacturing methods were simple and the plant food content low, not many people worried about a little shrinkage.

Today, however, highly concentrated raw materials are the rule, and these, with other cost items such as freight, handling charges and overhead, have underscored the problem.

Many fertilizer makers are asking themselves, "What is my shrinkage figure?" "How much is shrinkage costing me a year?" "What can I do to reduce this waste?" The inquirer has indeed hit a sensitive nerve in asking this question.

Some figures on what shrinkage costs the industry each year would be helpful at this point. In the year 1958-59, mixed fertilizers were made in the amount of 15,921,000 tons. Of this, 30.90% was actual plant food, or 5,083,116 tons purchased by the industry.

However, the amount sold came to only 4,919,591 tons, or a loss of 163,526 tons (3.21%).

Based on the weighted average of plant food content, this loss represents 529,210 tons of mixed fertilizer. This shrinkage cost the fertilizer industry nearly $1.57 a ton for every ton of mixed fertilizer made during the year, or a loss totaling some $25 million.

The questioner asked what are the sources of plant food loss in the plant. Here are some obvious ones:

1. **Materials unloaded either to storage or to operation**
2. **Materials weighed and/or metered to operation**
3. **Materials lost in processing**
4. **Product conveyed to storage**
5. **Product conveyed to bagging and/or bulk loading facilities**
6. **Shipping**

Materials handling equipment accounts for a major portion of plant losses. As raw material moves from car to plant, the first spillage is from the front-end loader. This spillage loss is caused by any or all of the following:

Overloading — excessive speed — poor routing—inexperienced handling—poor attitude about the job.

Losses can occur because the operator is filling the scoop to capacity —probably to save time and maintain maximum production. And too frequently the operator knows only two speeds—STOP and GO. And with steep inclines, sharp corners, and other hazards, it's little wonder that there is a conspicuous trail of raw material to mark the course.

The extent of losses caused by this movement of materials is difficult to measure, since much of the spillage is recoverable, either as raw material or as contaminated goods. The use of contaminated materials in formulation generally means a sacrifice in plant food and should be avoided.

There are corrective measures which can do much to eliminate spillage. These include: use of a training program; shortening the routing of materials; installing an effective housekeeping program; putting on additional labor or adding equipment; and noting causes of conveyor spillage and making corrections.

Training Program

Brief but thorough training should precede the operation of all material handling vehicles. This is the time to explain the serious nature of these losses. Show the operator the importance of his responsibilities, and explain in dollars and cents how sloppy operation sets a bad example for other workers and their jobs. And most important, ask him for suggestions on improving the operation. And also listen to what he has to say!

Shortening of Routing

Serious consideration should be given to shortening the route between car and operation. Where this is impossible or impractical, a study of the traffic pattern and raw material storage location should be reviewed with the operator. It's possible that even a small change here will noticeably decrease spillage.

Housekeeping Program

Attitudes of casual disregard or lack of regular housekeeping policies can mushroom into substantial losses. These attitudes often spread throughout the entire operation. A detailed housekeeping program should be set up to minimize the accumulation of large quantities of contaminated material. A good housekeeping program should include the following:

1. **Assign each operator a definite clean-up area.**
2. **Assign and explain responsibilities.**
3. **Supply necessary clean-up equipment—(brooms, shovels, air lines, etc.).**
4. **Establish and schedule housekeeping routines.**
5. **Note major equipment spillage and initiate corrective maintenance.**
6. **Establish policies and enforce them.**

Added Labor or Equipment

A study may indicate the need for any additional operator and/or additional equipment, particularly during the height of the season when material is moving to storage, operations and bagging simultaneously.

Conveyor Spillage

If needed, make the following corrections on conveyors:

1. **Eliminate sharp inclines.**
2. **Use rubber or canvas skirts at feed points.**
3. **Repair or replace worn belting.**
4. **Select adequately sized belts.**
5. **Interlock belt drives with feed and discharge equipment.**
6. **Align head and tail pulleys.**
7. **Use self-cleaning scrapers if handling moist or sticky material.**

Since shrinkage problems exist in both liquid and dry fertilizers, here is a rundown on problems pertaining to liquid handling equipment and other sources of possible loss.

Losses resulting from leaking valves, transfer lines, storage tanks and metering equipment, in relation to other losses, represent only a small portion of the overall shrinkage. If, however, leaking conditions are allowed to persist without applying corrective measures, corrosive fertilizer solutions will attack weak points in the system and cause eventual rupture and process losses. This can certainly disrupt production schedules and presents serious safety hazards.

Gradual build-up of solids in solution lines and metering equipment is usually difficult to detect, and often causes erratic measuring of solutions. These solids represent much more of a problem when they slough off and become lodged in the metering equipment. Erroneous readings are almost inevitable, and it is conceivable that damage to the meter may result.

Weighing, Metering Losses

Following the raw materials on into the plant, the next serious spillage loss may occur in weighing operations.

Measurement of raw materials is one of the most crucial steps in fertilizer processing and requires scien-

tific technique rather than a casual weighing procedure. Some of the causes for material loss resulting from inadequate or careless weighing methods include:

Scale insensitivity — particularly where a number of weighings per ton are required and the ratio of tare weight to material weight is high.

Poor location and **inadequate protection** of this equipment frequently results in exposure to rough treatment from in-plant traffic, spillage, dust contamination, and even adverse weather conditions.

Carelessness and abuse obviously is costly, but it is much too common, particularly during the busy season.

Lack of routine maintenance is especially costly with weighing equipment. This equipment must be kept in perfect condition.

Poor housekeeping means excessive shrinkage and premature equipment repairs or replacement.

In illustration, suppose a platform scale or a weigh hopper scale has become gradually defective because of abuse or even normal wear. This inaccuracy may exceed plus or minus 5 lb. per weighing, and could make each weighing represent a loss of five pounds. (This is not an unrealistic figure, nor is it erroneous to figure the scale will weigh excessive amounts as the desired weight is approached from the low side.)

When four weighings per ton are made on this scale, this results in a twenty pound material loss. This is a loss of 39.2¢ a ton, or roughly $3,900 for a 10,000 ton a year operation. (This figure is based on raw materials cost only.)

In the case of weigh hoppers and similar devices on which materials are weighed cumulatively, this loss is not as significant, but this type of equipment is susceptible to other ailments such as: leaky valves and gates, internal buildup, and pneumatic problems. All of these have a tendency to throw formulas out of balance. Too frequently the effect, rather than the cause, is treated by intentionally overformulating to restore this balance.

Continuous volumetric and gravimetric feeders are subject to error stemming from these same causes. As these types of equipment handle relatively large quantities of material over given intervals of time, even the slightest inaccuracy may result in substantial losses. Such equipment must be calibrated at frequent and regular intervals and performance records kept. This calibration should be checked at the beginning of each operating shift.

Generally speaking, the accuracy of metering equipment depends upon the selection of the proper equipment, a precise range of flow, and the correct interval and units of calibration.

It also follows, that as the cost of this equipment increases, accuracy over the full range of flow improves correspondingly. All equipment is subject to error, however, and should be regularly maintained and calibrated to insure continuous accuracy.

One of the more common metering errors is the variation caused by solution temperature changes. Most rotameters have been factory calibrated for solutions at a temperature of 60° F. The specific gravity of all fertilizer solutions is, in varying degrees, directly affected by temperature change. Normally, with a decrease in temperature, there is a corresponding increase in specific gravity.

As an illustration, consider the loss of anhydrous ammonia due to temperature difference between actual temperature of the anhydrous ammonia and that used for calibrating the flowmeter.

Because of its negative heat of vaporization, anhydrous ammonia is often metered between −10 and +10° F. A temperature differential from 50 to 70° represents an ammonia loss of 3 to 4 lb. per 100 lb. used. Such a loss is absolutely prohibitive, not only from a product quality standpoint, but from the cost angle as well.

Frequently, sustained flashing in the solution or anhydrous lines will result in metering inaccuracies. This can be minimized by using heat exchangers or increased pressure to compensate for the higher vapor pressure liquids.

Mixing Operation Losses

Perhaps responsible for more plant food loss than any other single source is the mixing operation into which raw materials are introduced in prescribed quantities for exact formulation. Formulation must take into account such critical factors as:

Raw material analyses
Anticipated process losses
Process efficiency
Ammoniation rates
Moisture control
Physical and chemical characteristics

Raw material analyses: Because of the variety of raw materials available, it is essential to know the analyses of every car of material that enters the plant. Accurate formulation without this knowledge is impossible. It would be difficult to calculate the losses introduced by errors caused by the use of raw materials differing slightly from their calculated values.

It is obvious that any variation from the true analysis of the raw material will not necessarily cause a weight shortage or overage, but it will cause an overage or shortage in the desired plant food content of the finished product.

For example, if seven units of P_2O_5 are desired from superphosphate which is used as containing 19.5% P_2O_5 but actually contains 19.75% P_2O_5, almost one-tenth of a unit of plant food is given away. Thus, if 100 tons of the grade are made this amounts to 10 units of a plant food worth roughly one dollar per unit, or ten dollars. And for 10,000 tons of grades with 7% P_2O_5 or over, this loss is $1,000 or more.

It must also be remembered that if the material used is higher in analysis than believed, this may force use of other materials of higher analysis and greater cost in order to achieve the total desired plant food in the formula. This, of course, introduces untold dollars in cost.

Anticipated Process Loss

Intentional overformulation is a common practice with many manufacturers. It is the simplest means of anticipating losses inherent in processing. The NPFI indicated in a recent survey that most companies allowed as an anticipated loss an average of 3.4% of the total nitrogen. (There are numerous ways of includ-

ing these overages in the formula.) Many manufacturers arbitrarily overformulate by ¼ unit on grades containing eight units or less of nitrogen, and as much as ½ unit on grades exceeding 12 units of nitrogen. It is also a common practice to overformulate on P_2O_5 to compensate for dust losses and reversion. This intentional overformulation can be minimized with the use of proper quality control methods.

Process efficiency is limited to some extent by the type of equipment used and the methods of processing raw materials. Formula calculations should take these limiations into account, giving consideration to such variables as recycle rate, retention in the mixer or ammoniator, type of sparging equipment, anticipated temperature changes, and whether drying and cooling facilities are used.

Normal superphosphate and triple superphosphate are influenced by a number of the phosphate's physical properties. These are particle size, porosity, moisture content, and free acid content. With a quality control program in effect, the grade of run-of-pile or coarse triple purchased from any one supplier should have a relative constant ammoniation or ammonia absorption rate. The triple supplier should give this recommended ammoniation rate. Using rates higher than those recommended will often lead to ammonia losses.

One should also become aware of his superphosphate's ammoniation rate, since different physical characteristics of the superphosphate may cause wide variations of this ammonia absorption rate. Indiscreet juggling of ammoniation rates can become an expensive and wasteful practice.

Moisture control over the entire process is a critical factor which can spell the difference between an efficient, smooth operation and a trouble-plagued one. If, for instance, a formula is calculated on the basis of 2% moisture in the final product, the consequence of exceeding this figure is an off-grade product. If the final product were found to contain only 1% moisture as a result of overdrying, then the fertilizer required to make up this 1% weight difference would have to be considered process loss, or shrinkage.

It has become a fairly common practice to formulate on a dry basis, taking into account the moisture content of each of the raw materials, predetermining the desired moisture content of the product, and then going back and converting the formula to a wet ton by adding the water removed.

In continuous granulation plants, most of which have dryers and coolers, slight variations in the moisture content of the ammoniator discharge are not as critical as in the batch type operation. In the case of the latter, one must primarily depend upon the heat of reaction to drive off the excess moisture. A simple **heat balance** will usually give an indication of the approximate temperature and moisture content of the discharged material.

Periodic moisture analyses of the products in storage should be obtained so that moisture losses occurring subsequent to the mixer can be established and taken into account in formula calculations.

Indiscriminate use of excess amounts of sulfuric acid can frequently result in nitrogen loss, even though the original intention was to retain larger quantities of ammonia. The formation of large plastic masses prior to the introduction of all of the ammonia or ammonia solution not only reduces the effective surface area of the reactants, and consequently the limits of reaction, but may cause localized overheating. This will result in wasted acid and lost nitrogen caused by thermal decomposition of ammonium nitrate.

Dust Losses

The problem of controlling internal and external dust losses is undoubtedly the most exasperating shrinkage problem in the entire plant. For the most part, dust losses represent only a small portion of the over-all material lost in granular plants, as compared with non-granular plants. The greatest portion of this dust loss escapes as air-entrained solids through exhaust systems on the ammoniator, dryer, and cooler. Most of these entrained solids are collected in conventional type cyclone collectors and returned to the process.

Lest anyone think that the escape of dusts is a minor matter, here is the comment of one manufacturer who has made some calculations: "We have found dust loadings in the exit gas, after passing through cyclones, of 1.25 grains per cubic foot. At the reduced air flow of only 20 000 CFM, this produces a dust loss to the atmosphere of almost one ton of fertilizer every eight hour shift. If someone was stealing one ton of fertilizer from your plant every shift, you would soon do something about it!"

Probably the greatest single cause for poor cyclone performance is the leakage of air into the dust outlet of the cyclone. A slight air leak at this point can result in a tremendous drop in collection efficiency, particularly with fine dust.

Some granulation plants have installed wet scrubbing equipment to recover the extremely fine dust fraction, ammonia vapors, and ammonium chloride which normally escape collection in the conventional dust collector. In formulas requiring additional water, it was found the recycled solutions from these wet scrubbers could be utilized in the ammoniator. Depending upon the degree of recycle and water requirements, these scrubbing solutions may contain as much as 2% nitrogen and a nearly equal amount of P_2O_5.

Dust losses are prevalent in all plants in varying degrees and, as such, must be considered as process loss, or in-plant shrinkage. These losses represent a needless "give-away" in terms of dollars and cents.

Bagging Operation

Plant managers are becoming increasingly aware of the magnitude of losses occurring in the bagging operation. They have reasoned that these losses not only represent wasted material, but the cost of processing this material as well. "A little extra for good measure" is consequently a very uneconomic expression.

As little as one pound excess per 80-lb. bag will result in a loss of 125 tons a year in a 10 000-ton plant. This is slightly more than three 40-

ton box cars. Thus, means must be found to insure closer weight controls. A program of this type usually includes:

1. **Regular and frequent checks of bag weight, using a platform scale located conveniently alongside the bag conveyor. The weight dial should be visible to the operator allowing him to make immediate adjustments if necessary.**
2. **Frequent checking of scale sensitivity and accuracy.**
3. **Enclosing of bagging equipment to prevent dust contamination. Valve-packing equipment usually as a dust port to which an exhaust system can be attached. This dust should be returned to the dust-collection circuit.**
4. **Installation of conveyor systems under the floor of the bagging operation to catch spillage and return it to the elevator.**
5. **A weight totalizer attached to the bagging equipment. This will provide the necessary information to calculate an average seasonal bag weight, and the extent and frequency of deviation from planned weight. This will also define the limits of normal operation and quickly point out period of off-calibration or faulty operation.**
6. **A neat and orderly bag storage area. Pellets and forklift trucks help eliminate excessive rehandling and bag breakage.**

The questioner should be assured, having perused the above material, that fertilizer shrinkage is indeed a critical profit factor in the manufacture of highly concentrated and complex products. Competent technical management demands careful analysis and control of shrinkage.

Turfgrass Conference Discusses Fungicides, Fertilizer and Lime

UNIVERSITY PARK, PA.—Lime, fertilizer, and fungicides came in for a lion's share of discussion during the 30th annual turfgrass conference held recently at Pennsylvania State University. Turfgrass leaders from 14 states and the District of Columbia swelled a capacity audience of over 250.

Fertilizer cannot affect plant growth fully in soils that are too acid, Albert S. Hunter, Penn State soil technologist, told the group. He pointed out that use of fertilizer on acid soils of pH 5.5 or lower without first liming the soil, creates conditions unfavorable for plant growth.

However, application of lime and mixing it with the soil raises the pH and provides a better medium for growing plants.

Another speaker, Roy P. Matelski, Penn State soil technologist, said that soil acidity determined in the field often differs from tests made in a laboratory. He claimed the majority of Pennsylvania soils are found to be more acid when determined in the laboratory. Tests between laboratory and field usually vary by about ½ pH unit, he said, but some can differ as much as 1½ pH units.

Proper application of both fertilizers and fungicides is essential for control of turfgrass diseases, declared Houston B. Couch, plant pathologist for the Pennsylvania Agricultural Experiment Station.

Stressing fundamentals of turfgrass disease control, Dr. Couch pointed out that fertilizer will not make plants immune to disease. He said tests for 5 years prove conclusively that fungicides must be used for disease control.

"Our experiments have shown that highly-fertilized grass—boasting good color and fast, lush growth—may be no more tolerant of fungus than less well-nourished turf," Dr. Couch stated.

He said he and James R. Bloom found that the fungus-caused disease, "brown patch," injured bentgrass fertilized with high nitrogen rates more severely than it injured bentgrass fertilized with high balanced N-P-K.

Similar relationships were observed with different fertility levels used to test effect of "dollar spot" on bentgrass. Tests were all made in silica sand which has no plant nutrients. Fertilizer was the only variable in the experiments.

Paul J. Wuest, graduate assistant in botany and plant pathology, claimed nematodes are more economically important in Pennsylvania than often realized. He described studies by Dr. Bloom, pathologist now on leave-of-absence from Penn State.

Mr. Wuest said nematodes can be controlled in porous soils, but high clay content soils reduce the effectiveness of nematocides about 50%.

Two commercial nematocides were reported effective for nematode control and have not injured grass in two years of testing in Pennsylvania.

Industry leaders taking part in the conference included F. V. Grau, agronomist for the Hercules Powder Co.; C. G. Wilson, agronomist for the Milwaukee Sewerage Commission; Tom Mascaro of West Point Products Corp., West Point, Pa.; and Gene C. Nutter of the Golf Course Superintendents Assn. of America.

General chairman of Penn State's 30th annual Turfgrass Conference was Joseph M. Duich, in charge of the turfgrass research and teaching program at the university.

EXPENSIVE PESTS

FORT COLLINS—Colorado farmers and ranchers saved nearly $28 million during the 1960 growing season by applying proper controls to damaging insects, a report issued by the Colorado Insect Detection Committee reveals.

The report, released by the entomology section of the Colorado State University Agricultural Experiment Station, estimates savings through controls last year amounted to $27,967,411. Cost of controls was less than 10% of the savings—$2,774,418.

Insects did only relatively light damage to crops and rangeland in Colorado as compared with the past. Losses due to insects were estimated at $6,673,940.

TONNAGE REPORTS

Arizona

MESA, ARIZ.—A total of 184,581 tons of fertilizer was sold during 1960, according to a recent report by the office of state chemist. Of this total, 67,272 tons were mixed dry fertilizers and 52,807 were liquid fertilizers.

In top places among the fertilizer materials were urea, with 16,582 tons, ammonium sulfate with 16,009 tons, and ammonium nitrate with 10,403 tons.

By far the most popular mixed fertilizer reported was 16-20-0, which was sold in the amount of 29,826 tons. The grade 10-20-5 was second, with 8,513 tons.

California

SACRAMENTO, CAL. — Farmers and gardeners in California used 1,275,463 tons of commercial fertilizers during 1960, according to reports of sales compiled by the California Department of Agriculture.

According to Charles Paul, State Director of Agriculture, liquid fertilizers accounted for 37% of the tonnage reported for 1960. Although total sales of commercial fertilizers set record high marks during the first and third quarters of 1960, total sales in the second and fourth quarters were slightly less than the record high reported for those two quarters of 1959, Mr. Paul said.

Georgia

ATLANTA, GA.—A total of 263,641 tons of fertilizer was reported in Georgia for the period July 1 to Dec. 31, 1960. This data was obtained through reports of the fertilizer industry to the state during the final six-month period of the year.

Indiana

LAFAYETTE, IND. — A total of 1,145,536 tons of fertilizer was sold in Indiana during the calendar year 1960, according to reports from fertilizer manufacturers to the state experiment station.

Of this total, 828,164 tons were sold in the spring, and 317,372 tons in the fall of the year.

The state reports that 278 different analyses of mixed fertilizer and straight materials were used in Indiana during the year 1960.

Iowa

DES MOINES, IOWA—A total of 760,122 tons of fertilizer was reported sold in Iowa for the 1960 calendar year, according to Clyde Spry, secretary, fertilizer division, Iowa State Department of Agriculture. The grade 5-20-20 was responsible for 116,586 tons, which was by far the greatest tonnage of any grade. The grade 5-20-10 was second with 63,207 tons. Also rating high was 10-10-10, with 42,824 tons, and 12-12-12 with 29,486 tons.

Of materials, 46% superphosphate was the most popular with 28,826 tons; while 60% muriate of potash was sold in the amount of 15,216 tons. Ammonium nitrate totaled 77,677 tons to lead in the nitrogenous material category.

The final tally was 252,530 tons of fertilizer materials, and 507,592 tons of mixed goods.

Kansas

TOPEKA, KANSAS — A total of 207,637 tons of fertilizer was reported to the Kansas State Board of Agriculture by fertilizer manufacturers for the period July 1, 1960, to Dec. 31, 1960.

Of the mixtures reported, 16-48-0 was the highest, with 33,702 tons, and 16-20-0 was second with 28,722 tons.

Of the materials, ammonium nitrate held a substantial lead with 44,750 tons. Superphosphate 30% was next with 19,236 tons. Liquid nitrogen solutions totaled 12,863 tons.

ATTRACTIVE PACKAGING—Two fertilizer companies have recently redesigned their line of packages for better merchandising, uniformity of family product identification, and for savings in bag costs. The latter, according to Union Bag-Camp Paper Corp. which did the redesigning art work, was accomplished through use of two colors instead of the three formerly used by Superior Fertilizer & Chemical Co., Tampa, Fla. (upper photo). By altering its bag design, the firm established a closer family relationship among its products. The former pesticide and fertilizer bags are on the left; the redesigned on the right. Below is redesigned line of packages introduced recently by F. S. Royster Guano Co., Norfolk, Va. The new design at bottom of photo features the stylized Royster name printed in bright yellow with green, red and blue background. A combination of vertical and horizontal printing is said to be unique. Vertical design on back of bag allows space for information on analyses of product. The horizontal design is on the front.

Kentucky

LEXINGTON, KY. — A total of 563,978 tons of fertilizer was sold in Kentucky during the calendar year Jan. 1 through Dec. 31, 1960, according to a report recently issued by the Kentucky Agricultural Experiment Station, Lexington.

Of this total, 458,737 tons were mixed goods, while 105,241 were listed as materials.

Of mixed goods, the 5-10-15 grade was by far the largest seller, with 102,745 tons to its credit. Second was 10-10-10 with 56,242 tons. The grade 6-12-12 tallied 40,895 tons.

Louisiana

BATON ROUGE, LA.—A total of 297 901 tons of fertilizer was sold in Louisiana during the 1960 calendar year, January through December.

The report was made by David L. Pearce, commissioner, Louisiana Department of Agriculture and Immigration.

Massachusetts

AMHERST, MASS. — A total of 68,246 tons of fertilizer mixtures plus 15,286 tons of materials is reported for the year 1960 by the Fertilizer Control Service, Massachusetts Agricultural Experiment Station.

Of the total tonnage of mixed goods, 55,034 tons were sold during the January-July period and 13,212 tons from July through December, the report says.

In the materials category, 11,397 tons were sold during January-July, and 3,889 tons, July-December.

Missouri

COLUMBIA, MO.—A total of 329,425 tons of fertilizer was shipped to dealers during the last six months of 1960, according to the Missouri Agricultural Experiment Station. Of the six months, October saw the greatest

movement, with 98,306 tons being shipped.

Of the total amount, 171,683 tons were mixed fertilizers, according to the report.

Nevada

RENO, NEV.—A total of 5,178 tons of fertilizer was sold in Nevada during the period Jan. 1-Dec. 31, 1960, according to the Nevada State Department of Agriculture. The mixture 16-20-0 was the most popular grade, with 798 tons being sold.

New Hampshire

CONCORD, N.H.—A total of 3,454 tons of fertilizers was consumed in New Hampshire during the last half of 1960, according to a report from the New Hampshire Department of Agriculture. The report, covering the period July 1-Dec. 31, 1960, says that 2,510 tons were in mixed fertilizers and 944 tons in materials. A total of 206 tons was delivered in the form of dry bulk fertilizers.

Of the fertilizer materials, ammonium nitrate was used in the amount of 259 tons and 20% superphosphate, 490 tons.

New Mexico

UNIVERSITY PARK, N.M. — New Mexico farmers set a new record in the use of commercial fertilizers in 1960, according to Gorden B. Hoff, extension agronomist with the New Mexico State University.

They used a total of 45,307 tons of fertilizer last year on 355,000 acres of crops. Average amount applied per acre was 240 pounds.

Over-all amount used in 1960 was 9% above 1959 and 333% more than the 13,649 tons purchased in 1950.

Figures for last year show that the leading nitrogen fertilizer was anhydrous ammonia. Farmers purchased 6,552 tons. Next in popularity of use was ammonium sulfate, 4,016 tons; urea, 3,887; nitrogen solutions, 2,113, and ammonium nitrate, 1,363 tons.

There were 8,622 tons of concentrated superphosphate purchased in the state compared to 7,020 tons of ordinary superphosphate.

The most popular mixed fertilizer was 16-20-0 with 5,301 tons sold in 1960. Other leading mixtures were 13-39-0 with 1,135 tons sold, 11-48-0 with 585 tons, and 21-53-0 with 413 tons. About 50 different formulations were sold in the state last year.

North Carolina

RALEIGH, N.C.—A total of 202,694 tons of fertilizer was shipped in North Carolina during the 6-month period, July-December, 1960, according to a recent report from the North Carolina Department of Agriculture.

The above figure compares to that of the same period of 1959, when 175,533 tons were tallied.

During the 1960 July-December period, October saw the greatest shipment, with 55,448 tons.

North Dakota

BISMARCK, N.D.—Fertilizer was consumed in the state of North Dakota in the amount of 145,103 tons during the calendar year of 1960, according to L. A. Koehler, state chemist. This figure compares to 141,863 tons sold in 1959, the report says. Other years' totals were as follows: 1958, 112,473 tons; 1957, 98,935 tons; 1956, 76,199 tons, and 1955, 58,693 tons.

Of the 1960 total, 19,303 tons were mixtures, of which the grade 16-16-8 was first with a tally of 4,411 tons. Second in use was 10-30-10 accounting for 2,310 tons. The grade 8-32-16 was next with 2,046 tons.

Fertilizer materials were used in the amount of 125,800 tons, of which ammonium phosphate, 11-48-0 contributed 31,072 tons. Superphosphate use was calculated at 26,073 tons and ammonium phosphate-sulfate in the amount of 16-20-0, 21,278 tons.

Oklahoma

OKLAHOMA CITY, OKLA. — A significant increase in fertilizer tonnage for Oklahoma during the period Oct. 1, 1960, to Jan. 1, 1961, has been reported by the Oklahoma State Department of Agriculture.

A total of 33,294 tons of fertilizer was recorded for this period as compared to 26,572 tons for the same period of the previous year.

Largest tonnage was enjoyed by ammonium phosphate, 16-20-0, which registered 3,266 tons as opposed to 2,630 tons in the same period the previous year.

Ammonium phosphate 13-39-0 was in second place, with 3,025 tons. This, also, was ahead of the same period of 1959, when 2,333 tons were tallied.

South Carolina

CLEMSON, S.C. — A 5% increase in fertilizer shipments has been reported for the July-December period of 1960 in South Carolina. Total tonnages for that period amounted to 110,096 tons, as compared to 104,903 tons during the same period of 1959.

Washington

OLYMPIA, WASH. — A total of 294,061 tons of fertilizer was sold in the state of Washington during 1960, according to a recent report by Allen Baker, supervisor of the State Department of Agriculture, Grain & Chemical Division. The 1960 total exceeded the 1959 figure of 264,153 tons. For comparison, the total for 1958 was 248,981 tons.

West Virginia

CHARLESTON, W.VA. — A slight increase of over-all fertilizer sales for 1960 was registered in West Virginia, according to a report by J. T. Johnson, commissioner, West Virginia Department of Agriculture. Total tonnages for all fertilizers sold in the state in 1960 amounted to 75,936 tons. This compares to 75,630 tons sold in 1959.

Mixed fertilizer tonnage comprised 85% of the total, but was down slightly from the previous year, the report says. The mixture of 5-10-10 had the largest reported tonnage, but was some 1,700 tons below the sales recorded in 1959.

Wisconsin

MADISON, WIS.—A total of 439,696 tons of fertilizer was reported in Wisconsin for the year 1960. According to W. B. Griem, of the State Department of Agriculture, the calendar year 1960 tonnage represents a decrease of 4.3% from 1959's figures.

Of the mixtures, 5-20-20 was the leader, with a total of 112,267 tons.

NEW TVA LICENSEE

MARKS, MISS. — The Riverside Fertilizer Co., Marks, Miss., has obtained a license from the Tennessee Valley Authority for use of process and apparatus for the ammoniation of superphosphate.

New Pesticide Handbook For 1961 Issued by USDA

WASHINGTON—A revised handbook on insecticide recommendations for 1961 has been issued by the U.S. Department of Agriculture.

"Insecticide Recommendations of the Entomology Research Division for the Control of Insects Attacking Crops and Livestock for 1961," Agriculture Handbook No. 120, details the recommended safe uses for chemicals that protect crops and livestock. This handbook has been published annually since 1957 by the Agricultural Research Service of USDA.

The recommendations are intended as a guide for entomologists, for other research and extension workers, and for various agricultural associations and agencies, rather than for individual farmers.

As a result of research during the past year, several new insecticides and more efficient dosages of some previously - recommended materials are suggested. Precautions to be followed by insecticide users also have been slightly amplified.

ARS entomologists again stress in the handbook the necessity of following directions and heeding all precautions on insecticide container labels. Users must avoid leaving harmful residues on or in food and feed. They should wear protective clothing when called for and take special care in handling and applying insecticides, and in handling plants treated with certain of these chemicals.

Insecticides should always be applied so as to minimize losses of honey bees, and to avoid adverse effects on fish and wildlife, the handbook points out.

Single copies of "Insecticide Recommendations of the Entomology Research Division for the Control of Insects Attacking Crops and Livestock" (AH 120) may be obtained for 65¢ from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Niagara Chemical Awarded Citation, Safety Plaque

MIDDLEPORT, N.Y.—A safety citation and plaque have been awarded to the Middleport, N.Y., headquarters of the Niagara Chemical Division, Food Machinery & Chemical Corp., for 1,491,887 man hours without a lost time accident. Presented by the Liberty Mutual Insurance Co., Boston, the award covers almost three years of accident-free operation—from May 23, 1957, to March 14, 1960.

Making the presentation were W. B. Huddleston, supervising engineer, and R. W. Burnett, safety engineer, both of the insurance company. Richard A. Broom, manager of Niagara's Region One (in which the Middleport plant is situated), accepted the award on behalf of the workers who made the record possible. According to Mr. Huddleston, the award is "visual proof" that a vigorous and imaginative safety program by management coupled with the interest and cooperation of labor, works to the benefit of both. "Such an award is not easily earned," he said.

Niagara's Middleport plant—which produces agricultural pesticides—includes in its safety program regular inspection tours of production facilities; strict regulations pertaining to use of safety clothing and equipment, and periodic health checkups for those working with toxic materials.

Results of 1960 Fungicide Tests Now Available

WINCHESTER, VA. — "Results of 1960 Fungicide and Nematode Tests" is now available. This report, issued annually by the American Phytopathological Society subcommittee on new fungicide and nematocide data, presents summarized results of current fungicide and nematode testing projects. Much of the information is never otherwise published or made conveniently available. Information on products available for testing, composition of products and their sources are given.

Copies of this report are available at $1.00 a copy when accompanied by a remittance, $1.25 when invoiced and billed. Address orders to A. B. Groves, Winchester Fruit Research Laboratory, 2500 Valley Avenue, Winchester, Va. Remittances should be payable to the American Phytopathological Society.

HEADS COMPANY

HOUSTON, TEXAS—J. A. Tennant, Jr., has been named president of Campbell Fertilizer Co. Mr. Tennant succeeds G. H. Seibel who was acting president and is now vice president in charge of manufacturing for the company.

Lining Completed in Canadian Potash Mine Shaft Prevents Interference from Seepage

ESTERHAZY, SASK., CANADA—An engineering feat that paves the way for opening Canada's potash reserves was completed March 25 by International Minerals & Chemical Corp. (Canada), Ltd.

The final bolt was placed in the cast-iron lining for 350 feet of a potash mine shaft 12 miles northeast of here, marking conquest of a problem which has stymied Canadian potash development for years.

This symbolic bolt was the last of some 17,000 used in putting together a 3,000-ton cast-iron lining which protects the shaft against the 200-ft. Blairmore stratum, occurring at Esterhazy between the 1240- and 1439-ft. levels. The Blairmore, a capricious geological stratum which carries oil in some areas, coal in others, and water under extremely high pressure in others, is composed of water-bearing sand and clay layers at Esterhazy.

To sink its shaft through this stratum, IMC's Canadian subsidiary used a freezing and "tubbing" technique new to this hemisphere but employed to solve similar shaft-sinking problems in Europe.

IMC engaged Associated Mining Construction, Ltd., to sink through the stratum and install the lining.

Before excavation could be started, the entire Blairmore stratum had to be consolidated over an area extending some 50 ft. around the center of the shaft area. This was accomplished by sinking 58 freeze pipes, 250 ft. long, in a circle around the shaft and running through them a lithium chloride brine at —58° F.

Freezing the area took almost a year, but when workmen began penetration of the Blairmore last fall it was solidly frozen at —50°. Actual shaft sinking was accomplished with pavement breakers. Workmen went down five feet at a time, installing a ring of tubbing every five feet. Each ring is made up of 11 4-ton segments, each about 5 by 5 ft. Of these, there are 76, running from the 1130-ft. level to 1488 ft.

To avoid possible water seepage at either end of the long tubular lining, special "sealing" rings were installed. The final seal between the ring and the wall of the shaft is accomplished by "pikotage," a technique employing wedges of specially imported Nicaraguan pitch-pine of various sizes and shapes. These are driven into the void until a sharp steel spike cannot be forced into the mass. Approximately 15,000 such wedges are used in each of three 55-ft. sealing circles.

The potash beds are located at 3,150 ft., and limestone formations in the last 1,600 ft. are expected to present no unusual problems. Initial production at the IMC shaft is expected during the fiscal year ending June 30, 1962.

PRODUCTION

Continued from page 2

earlier. Here the figures are 1,494,434 and 1,589,402 tons, respectively.

All these items, including sulfuric acid, were up in 1960 as compared to figures for the previous year. In the following reports, the figures for 1960 are preliminary, the statisticians state.

Synthetic anhydrous ammonia production in 1960 was 4,812,120 tons; for 1959, it was 4,519,705 tons.

Ammonium nitrate production was up also. In 1960, tonnage was 3,102,661 tons. In 1959, it was 2,857,435 tons.

Nitrogen solutions were produced in the amount of 819,125 tons in 1960 against a total of 779,745 in 1959.

Figures on production of phosphoric acid were 2,086,343 tons in 1960; and 1,881,405 tons the year before.

Sulfuric acid production climbed to 17,819,625 tons in 1960 as compared to 17,608,608 tons in 1959, the report says.

CSC Profits Improve in '60

NEW YORK — Commercial Solvents Corp. 1960 consolidated net earnings rose sharply to $1.70 per share, as compared with $1 per share for 1959, it was reported by Maynard C. Wheeler, president, following a recent meeting of the company's board of directors. The 1959 per share earnings are adjusted to reflect a 2% stock dividend in December, 1960.

The 70¢ per share improvement for 1960 is the largest annual earnings increase in a decade, Mr. Wheeler said. Total net earnings of $4,839,815 are the highest since 1951, and compare with $2,850,740 for 1959.

NEW REGISTRATION

KANSAS CITY, MO.—Guthion insecticide has been registered for use on grapes to control grape berry moth, leafhoppers and mites, according to its maker, Chemagro Corp., Kansas City.

Named Assistant Manager

SAN FRANCISCO, CAL.—Jack M. McConkey has been named assistant manager of agricultural sales in the Pacific Northwest by Wilson & Geo. Meyer & Co., Seattle.

Jack M. McConkey

Mr. McConkey, who joined the firm's Seattle sales staff in 1955, will continue in the Seattle office but with broadened responsibilities that include supervision of agricultural sales of the Yakima, Portland and Seattle offices of the firm. Paul Cortese, manager of agricultural sales, Northwest, is headquartered in San Francisco, the firm's head office.

Mr. McConkey is a native of Seattle and a graduate of the University of Washington in business administration.

Now on Stream . . .

Grace Ammonia Unit Adds 60,000 Tons To Capacity of Existing Plant at Memphis

NEW YORK—The Nitrogen Products Division of W. R. Grace & Co. is on stream with 60,000 tons of new ammonia capacity at its Memphis, Tenn., plant, William J. Haude, division president, announced March 13.

The new capacity brings the overall ammonia capacity of the nitrogen plant to more than 160,000 tons annually.

The additional ammonia capacity will go to satisfy in-plant requirements of the raw material for urea production, and outside to customers who have increased their consumption of ammonia, Mr. Haude said.

Until now, the urea production facility which adjoins the ammonia plant had to obtain a portion of its ammonia requirements from outside sources. Urea capacity, originally 50,000 tons a year, was doubled in 1959 making the Memphis plant the third largest urea tonnage facility in the U.S.

The new plant employs the steam methane process in which steam is reacted with natural gas to produce hydrogen. This in turn is combined with air and purified to form synthesis gas which is converted to ammonia.

W. R. Grace & Co., one of the nation's ten largest chemical companies, operates over 50 chemical plants in this country and overseas.

ADDITIONAL FACILITIES—Grace Chemical Division of W. R. Grace & Co. has recently added a 60,000-ton ammonia unit to its original plant in Memphis. Above is general view of $20 million plant which began operations in 1954. Below is silhouetted view of plant showing new portions on stream producing ammonia and urea. (Additional photo of operation appears on page 1, this issue of Croplife.)

Named Witco Officer

NEW YORK—Witco Chemical Co., Inc., has announced the election of Dr. Carlo Giraudi as vice president in charge of research, development and engineering.

Dr. Carlo Giraudi

In his new post, Dr. Giraudi's responsibilities extend to all Witco divisions and subsidiaries, including Sonneborn Chemical & Refining Corp., Ultra Chemical Works, Inc., and other wholly-owned company operations, both foreign and domestic.

Prior to the election, he was vice president and technical director of Ultra Chemical Works, Inc.—a Witco subsidiary—which he joined in 1949.

He received his Ph.D. from the Polytechnic Institute of Milan, Italy, and is a member of the American Institute of Chemical Engineers, the American Chemical Society, and the American Management Association.

STANDARD REPORTS

SAN FRANCISCO—Standard Oil Co. of California had net earnings in 1960 of $266,112,746, or $4.21 a share, compared with $253,599,061, or $4.01 a share in 1959, the company's recent annual report disclosed.

MCA Speakers to Include Secretary of Commerce

WASHINGTON — Luther H. Hodges, Secretary of Commerce, and Robert C. Tyson, chairman of the finance committee of U.S. Steel Corp., will be principal speakers at the 89th annual meeting of the Manufacturing Chemists' Assn., Inc., the association office has announced. The meeting, scheduled for June 8-10 at the Greenbrier Hotel, White Sulphur Springs, W.Va., is expected to attract some 800 executives from 180 chemical manufacturing companies.

Secretary Hodges will be the guest speaker at the annual banquet, June 9, and Mr. Tyson will address a business meeting the morning of June 8.

During the business session the association will present awards to six outstanding educators, culminating the MCA's 1961 College Chemistry Teacher awards. Each award includes a medal, citation and check.

Another feature will be presentation of Lammot DuPont Safety Awards to two member companies which showed the greatest percentage of reduction in their average disabling injury frequency rate for the past two-year period, compared with their rate for the immediately preceding three years.

IMC Appoints Four to Technical Positions

SKOKIE, ILL.—S. A. (Alex) Scott has been appointed chief mining engineer and Frank C. Pickard manager of prospect development in the Mining and Exploration Department of International Minerals & Chemical Corp.

F. C. Kruger, director, also announced the appointment of Dr. Donald H. Freas as geologist and David M. Williams as mining engineer.

Mr. Scott will continue to act as shaft sinking superintendent at the Esterhazy, Saskatchewan, potash project until its completion. He is a graduate of the University of British Columbia.

Mr. Pickard has been project engineer at the Esterhazy development for the past four years. Mr. Freas cames to IMC from Arizona State University in Tempe, where he has been a geology professor.

Mr. Williams, a graduate of Camborne School of Mines in Cornwall, England, joins IMC after six years with Rio Algom Uranium Mines in Elliott Lake, Ontario.

Representative Shifted

LOS ANGELES—W. P. Brashear, United States Borax & Chemical Corp. sales representative, has been transferred from Sulphur Springs, Texas, to Madison, Wis., it is announced by the U.S. Borax marketing department.

W. P. Brashear

Mr. Brashear will represent the company in Iowa, Wisconsin, Minnesota, North Dakota and South Dakota where he will handle the sale of agricultural and industrial chemical products, including potash, borax and boric acid. The new appointee is a graduate of Texas A&M College.

Joins U.S. Borax Corp.

LOS ANGELES—M. I. Signer, Jr., has joined United States Borax & Chemical Corp. in Carlsbad, N.M., as a senior mine engineer, it is announced by Dr. D. S. Taylor, vice president in charge of the firm's technical department.

Mr. Signer, former western phosphate project manager for International Minerals & Chemical Corp., also spent several years as Canadian project manager for International.

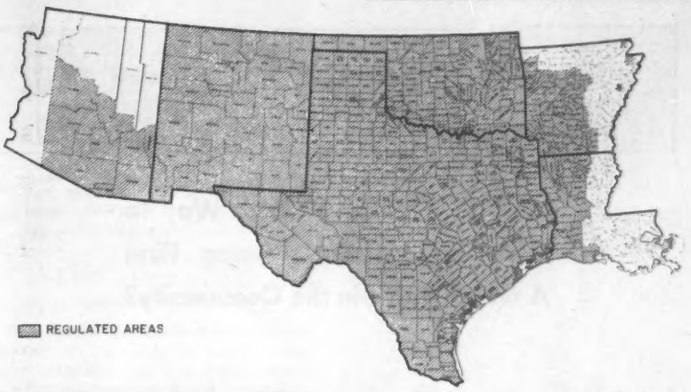
Norsk Hydro Expands Its Ammonia Production

GLOMFJORD, NORWAY — Norsk Hydro, manufacturer of nitrogen fertilizers, has recently completed the initial stage of its expansion program at its ammonia plant here. Output capacity for ammonia has been raised to over 70,000 tons a year, as compared to the former capacity of 65 000 tons.

The second stage in the expansion program is expected to bring capacity up to 86,000 tons annually. This portion is planned to be on stream in the 1964-65 season, reports indicate.

WITCO DIVIDEND

NEW YORK—The board of directors of Witco Chemical Co., Inc., has voted a regular quarterly dividend of 20¢ per share, payable on April 14, 1961, to shareholders of record as of March 31, 1961.



COTTON PEST REGULATED—The U.S. Department of Agriculture has recently announced areas of the cotton states as being under regulations for control of pink bollworm as of March 1, 1961. The entire states of Texas, Oklahoma and New Mexico are included, plus the southern two thirds of Arizona and large sections of the western portions of Arkansas and Louisiana. The pink bollworm is expected to be a severe pest of cotton this year. Above map was prepared by the Agricultural Research Service, USDA.

Handling Complaints | School Relations | Personnel Relations | Printed Publicity | Creditor Relations

Do You Go Out of Your Way to Give Your Manufacturing Firm A Good Name in the Community?

What's Your Public Relations Score?

(Check the List Below . . .)

REAMS OF copy have been written and hours of talks given on the subject of public relations and its importance to manufacturers of pesticides and fertilizers. The topic is a many sided one. It relates to the "status" of a firm in the community in which it operates, and in turn influences, to some degree, the acceptance of the products made by the company and hence its sales. "PR" is important, but is often either neglected or mishandled through inept or thoughtless acts.

Public relations does not operate as a fire department . . . to be called upon in case of emergency. Rather, it should be regarded as a preventive influence to keep emergency-type situations from developing in the community or among customers or employees.

Some farm chemical manufacturers regard "PR" as a high science, while others seem content to handle it through printed publicity. Neither viewpoint is incorrect, but neither covers the subject adequately. Actually, public relations, when boiled down to its essential elements, is the application of good common business sense to the way the manufacturing plant conducts its business with the public. The things done by both management and its employees mold public opinion—good or bad—about the company.

No one can go out and buy a pound, ton or yard of public relations. It is not for sale. Each organization creates its own. It must be planned. And, one must work on it to make it a success.

Here is a check list of the "raw materials" that go into making a successful public relations program for a manufacturing plant.

Check each of the points listed that you can honestly answer with an unqualified "yes." Then, add up your check marks and see what the score is for the firm's present public relations. The unchecked questions will suggest possible ways in which a more successful public relations program might be developed in the fertilizer or insecticide plant:

Civic Responsibility

——Do you belong to organizations in your community in each of these classifications — church, lodge, service club?

——Do you take an active part in at least one of these organizations of which you are a member?

——Are you a strong supporter of programs designed for the civic betterment of your community even though there is no personal gain involved?

——Do you participate in the recognized worthy charity drives in your community?

——Do you contribute your business know-how, facilities, and time to make every civic enterprise a success?

Personnel Relations

——Does your salary scale and employee benefit program compare favorably with other employers' plans in your community?

——Do you take a genuine and a sincere interest in your employees and in their problems?

——When it is necessary to discharge or lay off an employee, do you explain the situation completely to the worker?

——Do most of your advancements to better positions in your firm come from within your organization?

——Do you keep all of your employees informed about the goals, problems and position of your company all the time?

Business Correspondence

——Do you answer all letters you receive as promptly as possible?

——Do your business letters have a pleasant, friendly tone that gives a good impression of your business?

——Do you personalize your letters so that the person receiving the letter does not feel "you say that to everyone"?

——Does the physical appearance of your letters create the kind of impression you want people to have of your firm?

Telephone Technique

——When answering the telephone, do you have a "smile" in your voice?

——Do you introduce yourself and give your firm identification when answering the telephone?

——Do you make it a point to get your caller's name when you start talking on the telephone?

——Do you personalize your telephone conversation by using the caller's name while talking?

Creditor Relations

——Do you pay all invoices as promptly as possible within the dating allowed?

——Do you take only the discounts allowed on the invoice instead of mis-interpreting the terms or datings?

——Are you fair in seeking credits and adjustments for supplies and equipment you buy?

——Do you recheck carefully on any errors that seem to indicate a difference in invoice amount and the quantity received?

——When it is necessary to delay payment of an invoice for some reason, do you inform the vendor of the situation?

Advertising Attitude

——Do you know the publisher or editor of your local newspaper personally?

——Do you keep your newspaper informed of any personal or business activity that is newsworthy?

——Do you avoid the tendency to be a "publicity grabber" for any little thing that happens?

——Do you refrain from complaining about the amount of publicity you receive in comparison with other businessmen?

——Do you give the commonplace publicity about your firm a different twist to make it more interesting?

Handling Complaints

——Do you make every effort to handle all complaints and adjustments promptly?

——Do you try to be fair in all settlements offered to your customers about their complaints?

——When you are at fault, do you quickly shoulder the blame instead of grudgingly making an adjustment for the customer?

——Do you live up to the spirit as well as the letter of all agreements you make with your customers?

——When dealing with a "chronic complainer" are you fair, but firm?

School Relations

——Do you have special arrangements made with local school officials to handle speaking assignments on the fertilizer and insecticide industry?

——Have you considered a special scholarship for outstanding students to give your organization better recognition with parents and students?

——Have plans been made for handling tours of your plant for interested school groups?

——Do you know and inform local school people about films on the fertilizer and insecticide industry that are available?

——Do you encourage your employees to take advantage of the special evening instruction offered by local schools?

Credit Accounts

——Do you explain all your rules and regulations about your credit plan to your customers when the account is opened?

——Do you handle poor credit risks in a tactful manner to avoid possible ill will with other customers?

——When following-up over-due accounts, do you have a system that tries to hold the good will of these slow paying customers?

——Do you give your customers every opportunity to make some plan of settlement before taking drastic action on your accounts?

Printed Publicity

——Do all of your advertisements fit into the character you want to create for your business?

——Are your advertisements prepared in good taste to give people a feeling of confidence in your fertilizer and insecticides?

——Do you avoid the tendency to knock your competition in your advertising?

——Do all of your advertisements have some means of identification for your business?

——Do you avoid any misleading or semi-true advertising that could be a business boomerang?

The above questions give a cross-section of the plant's public relations program. All are important to the future success of one's business and all have a bearing on the opinion the public will have of the company. By applying good common business sense to any areas that show a weakness, public relations in the community can be improved noticeably.

"Where's this Automation you've been promising us?"

Croplife®

A BUSINESS PAPER FOR THE FARM CHEMICAL INDUSTRY

Business Is Good, Thank You! . . .

Industry Reports Brisk Sales Thus Far in Season; Production Bottleneck May Occur

WITH MOST indications now pointing to an upward swing for business, the makers of fertilizers and pesticides should feel the lift perhaps more strongly than some other types of enterprise might expect. The bottom of the current "recession" has apparently been reached and the slow climb back has begun. According to replies received from industry leaders when asked about prospects for sales of both fertilizers and pesticides during the season just getting under way, there is apparently much optimism in the trade.

In fact, fertilizer deliveries are currently getting off to a good start in most sections of the country, quite in contrast to the situation last year, caused by extremely unfavorable weather which characterized the spring of 1960. Pesticide industry people likewise report good volume and prospects for more sales than were recorded last year.

A number of favorable comments have been heard from industry people in connection with this year's shipments. The good weather in March and early April stimulated an unusual demand in some sections, and some firms indicate that sales are running 10% ahead of this time last year. This is said to be true of most of the nation except the East where the weather was too wet for fertilizer application during the early part of the selling season.

Some fertilizer sales executives have expressed belief that more than weather is responsible for the steeply accelerated sales curve. One industry observer points out that farm income last year was $11.6 billion as compared to $11.3 billion the year before, and such a situation creates a favorable atmosphere for farmer optimism and resultant purchases.

Although the selling season will continue to roll into early June, prospects as of now point to a better year than was experienced in 1960. Some observers have indicated that the sales may be limited by the industry's production capacity this year.

Still another factor looms large in any year when tonnages run high. That is the availability of transportation in the form of rail cars and trucks to haul the millions of tons of plant food to distribution points. As everyone in the trade knows, about two-thirds of the entire year's tonnage is moved in a brief, frenzied, concentrated 2½-month period. If projections of a 27 million ton year are realized, that means some 18 million tons will have to be handled in a short time. Are facilities available to take care of this kind of tonnage? It is a brow-wrinkling problem for many.

★ ★ ★

IT IS of interest, also, to note how business people outside the agricultural chemical "family" observe the trends. One New York investment brokerage firm issued a recent booklet report on the chemical industry, and stated that with any moderate rise in general business in 1961, the chemical industry should have another good year.

"During periods of business recovery, the industry in the past has usually displayed better than average growth with improvement in profit margins and higher earnings," it said. "Furthermore, in view of the labor-cost squeeze experienced in 1960, it seems likely that prices generally will rise."

Part of the optimism for the chemical trade (not specifically that portion of the industry involved with making fertilizers and pesticides) is based on the chemical industry's activity in 1960 when it displayed a strong rate of growth with chemical consumption increasing about 7.6% over the previous year. "This gain was better than the average annual rate of growth of 5.1% for the past decade and was substantially ahead of the rise of an estimated 2.7% for the economy as a whole. In fact, the growth rate of the industry may even accelerate . . .

"Although demand was strong in 1960, prices of the industry averaged about the same as a year ago, except for price reductions in items like synthetic fibers and some plastic materials.

"Costs were higher, notably wages, and profit margins contracted. This is typical for the chemical industry during a period of moderate business decline, such as in 1960."

This is not particularly news to manufacturers of pesticides and fertilizers. The "squeeze" has been on for a long time and is likely to continue. Aside from more intensive sales efforts on the part of industry, a most important consideration is that of reducing costs of production, thus opening a little wider the very slim area between actual costs and selling price.

A continuing trend toward modernization within the plant is becoming more noticeable all the time, and more and more opportunities are presenting themselves for achieving production shortcuts and savings which in many cases might make the difference between profit and loss.

British Wildlife Groups Protest Use of Chemicals

WILDLIFE enthusiasts, naturalists and conservationists in Great Britain are reportedly locking horns with farmers and the Ministry of Agriculture over the use of seed-treating chemical products which the naturalists say are killing wild birds and animals that eat the birds.

The outcry in England sounds quite familiar to American ears which have become accustomed to similar charges concerning "indiscriminate" spraying and dusting of insecticides to control pests such as the gypsy moth and the fire ant. In England, however, attention of the protesters is focused on seeds of wheat, barley and oats treated with both fungicides and insecticides. Wild birds which extract the seed from the ground are said to die soon thereafter, and wild animals such as badgers and foxes, eat the birds and are also killed, the complainers say.

Despite pressure from conservationists of all persuasions, the Ministry of Agriculture has thus far refused to restrict the sale of fungicides and insecticides. The Ministry has promised to review the situation at the end of the year, however, and naturalists are continuing to collect every shred of evidence to be presented at later hearings.

Probably the Ministry will think twice before proposing curtailment of chemical aids to agriculture, since Britain is far from being a self-sufficient supplier of its own food needs. Surpluses are practically unknown in that country, not to mention their being any kind of a problem. Thus, the argument sometimes put forward in the U.S., that chemicals are not necessary because of abundance, would really fall flat on its face in the country which is the world's greater importer of foodstuffs.

Croplife's Home Office

Croplife®

BPA — *Member of Business Publications Audit*

NBP — *Member of National Business Publications*

Lawrence A. Long, Editor
Donald Neth, Managing Editor

John Cipperly, Washington Correspondent

ADVERTISING STAFF — Wayne M. Soule, Advertising Sales Manager; Carl R. Vetter, Advertising Department Manager; Bruce A. Kirkpatrick, Advertising Production Manager; Jerome C. Whiting, Assistant Advertising Production Manager; R. Dale Swenson, Promotion Manager; James S. Barden, Marketing and Research Director.

BUSINESS STAFF—Milton B. Kihlstrum, President; Wilfred E. Lingren, Executive Vice President; Don E. Rogers, Vice President; Paul L. Dittemore, Vice President; Donald Neth, Secretary; Norman Couper, Treasurer and Controller; James G. Pattridge, Assistant Treasurer; Harry M. Dunn, Jr., Circulation Fulfillment Manager; Richard Ostlund, Office Manager; Walter O. Buchkosky, Production Superintendent.

ADVERTISING REPRESENTATIVES

EASTERN STATES—Paul L. Dittemore, Manager; Archy S. Booker, Jr., and James W. Miller, Advertising Sales Representatives; Room 1101, 52 Vanderbilt Ave., New York 17, N.Y. (Tel. Oregon 9-2490).

CENTRAL STATES—Don E. Rogers, Manager; Amos W. Standish and Robert M. Harrison, Advertising Sales Representatives; 2832 Board of Trade Bldg., 141 W. Jackson Blvd., Chicago 4, Ill. (Tel. Harrison 7-0515).

SOUTHWEST—Martin E. Newell, Manager; Thomas E. Letch, Assistant Manager; 612 Board of Trade Bldg., Kansas City 5, Mo. (Tel. Victor 2-1350).

NORTHWEST—Wayne M. Soule and Paul A. Anderson, Advertising Sales Representatives, P.O. Box 67, Minneapolis 40, Minn. (Tel. Franklin 4-5200).

WASHINGTON CORRESPONDENT — John Cipperly, 604 Hibbs Bldg., Washington, D. C. (Tel. Republic 7-8534).

WESTERN STATES — The Maurice A. Kimball Co., Inc., 2550 Beverly Blvd., Los Angeles 57, Cal. (Tel. Dunkirk 8-6178); The Maurice A. Kimball Co., Inc., 681 Market St., San Francisco 5, Cal. (Tel. Exbrook 2-3365).

EXECUTIVE AND EDITORIAL OFFICES — 2501 Wayzata Blvd., Minneapolis, Minn. Tel. Franklin 4-5200. Bell System Teletype Service at Minneapolis (MP 179), Kansas City (KC 295), Chicago (CG 340), New York (NY 1-2452), Washington, D.C. (WA 82).

Published by

THE MILLER PUBLISHING CO.

2501 Wayzata Blvd., Minneapolis, Minn.
(Address Mail to P. O. Box 67, Minneapolis 40, Minn.)

Associated Publications—The Northwestern Miller, Farm Store Merchandising, Feedstuffs, Feedlot, Professional Nursing Home

April 12-14—Chemurgic Council, 26th annual conference, Sheraton-Gibson Hotel, Cincinnati, Ohio.

June 5-7—Association of Southern Feed, Fertilizer and Pesticide Control Officials, Lafayette Hotel, Lexington, Ky.

June 11-14—National Plant Food Institute, annual meeting, The Greenbrier Hotel, White Sulphur Springs, W.Va.

June 18-21—Northeast Regional Branch, American Society of Agronomy, joint meeting with Eastern Section, Canadian Societies of Agronomy and Soil Science, University of Vermont, Burlington, Vt.

June 19-22—Western Societies of Soil Science and Crop Science with Pacific Division, American Association for the Advancement of Science, University of California, Davis, Cal.

June 27-29—Pacific Northwest Plant Food Assn., summer conference, Marion Hotel, Salem, Ore.

June 27-29—Twelfth Annual Fertilizer Conference of the Pacific Northwest, Marion Hotel, Salem, Ore. Chairman: B. R. Bertramson, agronomist, Washington State University, Pullman.

July 5-7—American Society of Agronomy, Midwest branch meeting, University of Wisconsin, Madison.

July 19-21—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.

Aug. 16-20—Canadian Fertilizer Assn. annual convention, Manoir Richelieu, Murray Bay, Quebec. R. P. Pennington, 2 Carlton St., Toronto 2, Ont., secretary-treasurer.

Sept. 10-13—Farm Equipment Institute, 68th annual convention, Palmer House, Chicago.

Oct. 9-11—Western Agricultural Chemicals Assn., annual meeting, Hotel Claremont, Berkeley, Cal.

Oct. 29-Nov. 1—National Agricultural Chemicals Assn., 28th annual meeting, Homestead Hotel, Hot Springs, Va.

Nov. 2-3 — Pacific Northwest Plant Food Assn. annual convention, Hotel Gearhart, Gearhart, Oregon.

Nov. 7-10—Packaging Machinery Manufacturers' Institute Show of 1961, Cobo Hall, Detroit, Mich.

Nov. 12-14 — California Fertilizer Assn., thirty-eighth annual convention; Jack Tar Hotel, San Francisco.

Nov. 27-30—Entomological Society of America, annual meeting, Miami, Fla.

Nov. 27-30—American Society of Agronomy annual meeting, with Soil Science and Crop Science Societies included, Sheraton-Jefferson Hotel, St. Louis, Mo.

1962

Jan. 17-19, 1962 — Southern Weed Conference, Hotel Patten, Chattanooga, Tenn.; Dr. R. E. Frans, Dept. of Agronomy, University of Arkansas, Fayetteville, secretary-treasurer.

Davison Chemical Division Buys Wichita Facility

BALTIMORE, MD. — Purchase of the Wichita Fertilizer Co. facilities at Wichita, Kansas, has been announced by W. N. Watmough, Jr., vice president for mixed fertilizers of W. R. Grace & Co. Davison Chemical Division.

Davison, a major producer of agricultural chemicals in the U.S., has been in business for many years in Kansas. Acquisition of the sales and production staff of the Wichita company will enable expanded sales and service operations in this area, Mr. Watmough said.

A variety of fertilizer grades will be offered at the new Davison facility, including high analysis grades produced for the Kansas area by the company's plant at Joplin, Mo.

Salesman Named by American Potash, Chemical

CHICAGO—Edward O. Carlton has been appointed sales representative for American Potash & Chemical Corp. with headquarters in Kansas City, Mo., John L. Anderson, Chicago district sales manager, has announced.

Mr. Carlton, a 1949 chemical engineering graduate of Purdue University, will service southern Illinois, Missouri, northern Oklahoma, eastern Kansas, Nebraska, South Dakota and southwestern Iowa.

Prior to joining American Potash, Mr. Carlton, a World War II Air Force veteran, was with Swift & Co.

OFFICERS NAMED

★

MOBILE, ALA.—The following officers were elected at the recent 35th annual meeting of the Southeastern Branch of the Entomological Society of America at Mobile: Carroll N. Smith, USDA, Orlando, Fla., chairman; R. J. Kowal, USDA, Asheville, N.C., chairman-elect; John S. Roussel, Louisiana State University, Baton Rouge, La., secretary-treasurer; L. D. Newsom, Louisiana State University, Baton Rouge, La., representative of the governing board, and George D. Jones, North Carolina State College, Raleigh, N.C., and L. A. Hetrick, 1624 N.W. 12th St., Gainesville, Fla., members of executive committee.

New Pesticide Plant Under Construction

SAN FRANCISCO — Ground has been broken by the California Farm Supply Co. for a new chemical manufacturing plant to be located in northern Tulare county, according to Louis A. Rozzoni, CFS president. Construction is now under way, and equipment is being assembled. Ground-breaking ceremonies were held March 16.

The plant will manufacture a complete line of insecticides, including liquids, wettable powders and dusts, and is expected to be in operation in time for the heavy insecticide-use season ahead. Liquid products will be available first.

The new plant, on six acres near Traver, on old Highway 99 and just east of the new freeway, will be located in the heart of one of the principal heavy insecticide use areas in California, Mr. Rozzoni points out.

He goes on to say that several County Farm Supply Companies in California have joined together to assist in the initial financing of the new plant. These companies plan to utilize a substantial proportion of its production.

New Ammonium Nitrate Plant in Netherlands

PERNIS, THE NETHERLANDS—Construction of a new ammonium nitrate plant is planned to begin here soon. The new plant, according to reports from officials, is to have a daily capacity of 285 tons ammonium nitrate. It will belong to NV Maatschappij Tot Exploitatie Van Kooksovengassen of Holland.

Engineering responsibilities have been turned over to Societe Belge de l'Azote et des Produits Chimiques de Marly, of Liege, Belgium. The unit will utilize SBA's patented processes in the production of ammonium nitrate.

Ohio Plant Planned

WILMINGTON, DEL.—Plans for a multi-million dollar methanol plant to be built near Huron, Ohio, have been announced by E. I. duPont de Nemours & Co., Inc. One of the uses for methanol, the company says, is in the manufacture of formaldehyde which in turn is used in making agricultural chemicals.

Construction is to start late this year with completion in late 1962 or early 1963. DuPont also has a methanol plant at Belle, W.Va.

NEW DISTRIBUTOR

CEDAR RAPIDS, IOWA — West Florida Equipment Co., Marianna, Fla., has been made a distributor for Highway Equipment Co., Cedar Rapids. The line comprises lime spreaders, combination fertilizer and lime spreaders, widespread lime and fertilizer spreaders and mobile blenders.

CALENDAR FOR 1961-62

APRIL

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MAY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

JUNE

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

JULY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

AUGUST

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

SEPTEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

NOVEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

DECEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

JANUARY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

FEBRUARY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

MARCH

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

INDEX OF ADVERTISERS

The index of advertisers is provided as a service to readers and advertisers. The publisher does not assume any liability for errors or omissions.

an exclusive service to the industry

Three big names are linked together to serve the fertilizer industry—easily, quickly, economically, and expertly.

BRANCH OFFICES: NORFOLK, VA. • CHARLESTON, S. C.
TAMPA, FLA. • JACKSON, MISS.
COLUMBUS, OHIO • MONTGOMERY, ALA. • DES MOINES, IOWA